



# **Schriever AFB, Colorado**

**Final**

## **Environmental Assessment**

### **Proposed Security Fence Around the Buffer Zone of the Installation**



***October 2003***

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**FINDING OF NO SIGNIFICANT IMPACT (FONSI)  
and  
FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)  
for  
Constructing a Security Fence in 100-Year Flood Plain  
Schriever Air Force Base, Colorado**

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**INTRODUCTION**

The United States Air Force proposes to construct a security fence around the buffer zone of Schriever Air Force Base, Colorado. Pursuant to Section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality regulations (40 CFR Sec 1500-1508) implementing procedural provisions of NEPA the Department of Defense (DoD) gives notice that an environmental assessment (EA) has been prepared for the proposed construction of the security fence at Schriever AFB, attached and incorporated by reference. This document serves as both a FONSI and a FONPA. This FONSI/FONPA has been prepared in accordance with Executive Order (EO) 11988, Floodplains Management. It is being prepared because a portion of the current boundary of Schriever AFB lies within the 100-year floodplain and to maintain the integrity of the base boundary, a portion of the fence would be constructed within the floodplain. An Environmental Assessment was prepared for the proposed construction of a Security Fence and is incorporated by reference.

**THE PROPOSED ACTION AND ALTERNATIVE ACTIONS**

The following paragraphs describe the Proposed Action and No Action Alternative.

**PROPOSED ACTION**

In accordance with DoD Instruction 2000.16, *DoD Combating Terrorism Standards*, Air Force Instruction (AFI) 31-101, *The Air Force Installation Security Program*, and Air Force Handbook (AFH) 32-1084, *Facility Requirements*, DoD installations are required to implement antiterrorism/force protection construction standards and to develop protective measures for DoD assets. Schriever AFB has chosen to implement antiterrorism/force protection measures, in accordance with AFH 31-101 and AFI 32-1084, by constructing a perimeter fence around their buffer zone.

The Proposed Action is to enclose the entire base with an 8-foot high chain link fence with an outrigger on the top. The total enclosed area would be 3,840 acres (6 square miles); of this, 640 acres is developed land and the rest is a buffer zone that consists of shortgrass prairie.

The fence would be a 7-foot high, 9-gauge steel wire fabric, chain-link fence with one outrigger (facing outward) with three strands of barbed wire. The overall height of the fence with outrigger would be 8 feet. The fence would be constructed 15 inches inside an existing barbed wire fence, which is currently located 3 inches inside of the base perimeter. The distance between line posts of the proposed fence would not exceed 10 feet. Foundations for line posts, constructed of concrete, would be 12 inches in diameter with a minimum depth of 42 inches below grade. Foundations for terminal and gate posts would be 18 inches in diameter. The proposed fence would have a tension wire along the entire bottom of the chain link fabric and a top rail along the

top of the fabric. Four-inch tension poles would be installed at every corner, transition point, or 150 feet.

The existing barbed wire perimeter fence would be maintained until installation of the proposed new security fence is complete. The contractor would then remove the existing barbed wire perimeter fence and recycle the materials as applicable.

Where the fence would cross stream beds, one of two options would be implemented. The first option is to construct the fence following the contours of the ground. The second option is to construct a hanging wall up to 4 feet high. The wall would be constructed on concrete footers and the fence would be constructed on top of the wall. The walls would be constructed of concrete, on concrete footers, with several drainage holes to allow stream flow to pass through. The best option to implement construction of the fence would be determined during the project design phase based on engineering analysis and the nature and expanse of the stream bed that the fence would cross over.

## **NO ACTION ALTERNATIVE**

Under the No Action Alternative, no additional security measures would be taken to protect the base perimeter boundary at Schriever AFB. The existing barbed wire fence would be left in place.

## **ENVIRONMENTAL EFFECTS**

The environmental effects of the Proposed Action and Alternative are summarized below.

**Air Quality.** The Proposed Action would have short-term, but not significant, impacts on air quality generated by installation of the security fence around the buffer zone. The Proposed Action conforms to the State Implementation Plan and is exempt from further conformity review. Schriever AFB would remain below thresholds for a major source and Prevention of Significant Deterioration review requirements. The base would also continue to be a minor source of hazardous air pollutants. Air quality would not change under the No Action Alternative.

**Geological Resources.** Impacts to geological resources would not occur because the soil depths exceed the drilling depth along the entire perimeter of the fence boundary. Topography and soils would be directly impacted from boring, grading, and compaction by equipment during construction. About two acres would be disturbed by the Proposed Action; impacts would not be significant. Geological resources would not be impacted under the No Action Alternative.

**Water Resources.** Boring holes and installing the proposed security fence would not disturb the unconfined surficial aquifer. Impacts to groundwater would not be significant. Impacts to surface water from erosion or storm water runoff would not be significant. There would not be any long-term impacts to water resources. Coordination with the USACE has determined that constructing the fence would not include any discharges of dredged or fill material into waters of the United States. If the No Action Alternative were selected, there would be no change in water resources.

**Biological Resources.** Impacts to biological resources would result primarily from small scale excavation activities associated with the construction of the security fence. The effects of fence

construction would minimally impact vegetation and wildlife in the project area. No critical habitat, threatened or endangered species, or wetlands would be affected by the Proposed Action, and following best management practices, no increases in noxious weed populations are expected. Therefore, impacts to biological resources would not be significant. Coordination was conducted with the U.S. Fish and Wildlife Service and the Colorado Division of Wildlife. Under the No Action Alternative, there would be no change in the biological environment of the project area.

**Environmental Justice.** Activities related to the Proposed Action were evaluated to determine if they would disproportionately impact a minority population or low-income population, or children. None of the impacts from construction of the proposed security fence would be significant, and they would not disproportionately impact a minority population or low income population, or children. No significant environmental justice impacts were identified from the Proposed Action.

**Solid Waste.** No significant impacts would occur from disposing of or recycling solid waste generated by construction of the proposed security fence and removal of the existing barbed wire fence. No changes to the solid waste program would occur from the No Action Alternative.

There would be no significant **cumulative impacts**.

## **PRACTICABLE ALTERNATIVES AND ENVIRONMENTAL EFFECTS**

EO 11988 provides that if a Federal government agency proposes to conduct an activity in a 100-year floodplain it will consider alternatives to the action and modify its actions, to the extent feasible, to avoid adverse effects or potential harm. Alternatives were considered to minimize impacts to floodplains and other environmental resources. The base considered leaving the existing barb wire fence in place on the east side of the base and in the floodplain and constructing the new fence inside the base boundary (southwest of the floodplain) to avoid the floodplain. This alternative would not meet Air Force and DoD force protection requirements to protect and secure military boundaries. The base also considered leaving the existing barb wire fence in place in the floodplain and installing security cameras on poles every 200 feet just outside the floodplain area. This alternative would require installing power cables to be installed over an extensive area.

Approximately 8.5 acres in the northeast corner of the base are in the 100-year floodplain of the West Fork of the Black Squirrel Creek. About 1,800 feet of the boundary line of Schriever AFB is within the floodplain. Constructing the proposed security fence in the floodplain would add about 140 square feet (less than 0.01 acre) of impermeable surface to the floodplain. This would negligibly affect the hydrology of the affected floodplain area. Minor grading of the pathway for the fence (in order to put a tension bar at the bottom of the chain link fabric and for placing fenceposts) would only negligibly impact the elevation of affected areas (there would not be any net increase in elevation). The potential impacts of flooding in this area would not substantially change (the elevation of flood waters, or the impacts of floods on erosion rates or siltation would not substantially change from current conditions). Coordination with the U.S. Army Corps of Engineers was conducted and concluded that the proposed security fence does not include any discharges of dredged or fill material into waters of the United States. Portions of the fence

could potentially be damaged from flooding, but this would not result in any significant environmental impacts. Constructing part of the proposed security fence within the floodplain would not result in any significant impacts to water resources.

AFI 32-7064, *Integrated Natural Resources Management*, lists three criteria that must be met for the USAF to construct in a floodplain: evaluate and document the potential effects of such actions through the environmental impact analysis process; consider alternatives to avoid these effects and incompatible development in the floodplain; and design or modify actions in order to minimize potential harm to or within the floodplain. These criteria have been met, and proposed measures to minimize harm to floodplains are documented in the EA.

This EA and FONSI/FONPA satisfy the requirements of AFI 32-7064.


### **Finding of No Significant Impact**


Based on the attached EA, conducted in accordance with the Council on Environmental Quality Regulations implementing the National Environmental Policy Act of 1969, as amended, and 32 CFR 989, 15 Jul 99, and amended 28 Mar 01, an assessment of the identified environmental effects has been prepared for the proposed construction of the security fence at Schriever AFB. I find that the action will have no significant impact on the quality of the human environment; thus, an Environmental Impact Statement is not warranted.

### **Finding of No Practicable Alternative**

Pursuant to EO 11988, and taking the above information into consideration, I find that there is no practicable alternative to this action and that the Proposed Action includes all practicable measures to minimize harm.

This combined FONSI/FONPA was reviewed and approved by the chairperson of the Environmental Protection Committee at Schriever AFB.

  
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DANIEL P. LEAF  
Lieutenant General, USAF  
Vice Commander, AFSPC

  
\_\_\_\_\_  
Date



## COVER SHEET

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**Agency:** U.S. Air Force

**Title:** Construct Security Fence Around Buffer Zone at Schriever Air Force Base, Colorado

**Date:** October 2003

**Contact:** Ms Melissa Trenchik, 50 CES/CEV, 300 O'Malley Avenue, Suite 19, Schriever Air Force Base, Colorado, 80912-5019. Telephone (719) 567-3360

**Designation:** Final Environmental Assessment (EA)

**Abstract:** This Final EA has been prepared in accordance with the *National Environmental Policy Act* (NEPA) of 1969, as amended. The purpose of constructing the security fence is to implement antiterrorism/force protection measures and increase security at Schriever Air Force Base. The Proposed Action is to construct approximately six miles of perimeter fencing along the installation's boundary. The security fence would be a seven-foot high chain-link fence with three strands of barbed wire angled outward at the top. This EA assesses the potential environmental impacts of constructing the security fence around the buffer zone at Schriever AFB. The No Action Alternative was also analyzed in the EA. Constructing the security fence would result in short-term but not significant impacts to air quality, and water, geological, and biological resources from construction activities. There would be no impacts to minority populations or low-income populations or children. Recycling of the old fence would not increase solid waste levels in the local landfill.



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**FONSI/FONPA**



**FINDING OF NO SIGNIFICANT IMPACT (FONSI)**  
*and*  
**FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)**  
*for*  
**Constructing a Security Fence in 100-Year Flood Plain**  
**Schriever Air Force Base, Colorado**

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**Solid Waste.** No significant impacts would occur from disposing of or recycling solid waste generated by construction of the proposed security fence and removal of the existing barbed-wire fence. No changes to the solid waste program would occur from the No Action Alternative.

There would be no significant **cumulative impacts**.

## **PRACTICABLE ALTERNATIVES AND ENVIRONMENTAL EFFECTS**

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environmental impacts. Constructing part of the proposed security fence within the floodplain would not result in any significant impacts to water resources.

Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management*, lists three criteria that must be met for the USAF to construct in a floodplain: evaluate and document the potential effects of such actions through the environmental impact analysis process; consider alternatives to avoid these effects and incompatible development in the floodplain; and design or modify actions in order to minimize potential harm to or within the floodplain. These criteria have been met, and proposed measures to minimize harm to floodplains are documented in the EA.

This EA and FONSI/FONPA satisfy the requirements of AFI 32-7064.

### **Finding of No Significant Impact**

Based on the attached EA, conducted in accordance with the Council on Environmental Quality Regulations implementing the National Environmental Policy Act of 1969, as amended, and 32 CFR 989, 15 Jul 99, and amended March 28, 2001, an assessment of the identified environmental effects has been prepared for the proposed construction of the security fence at Schriever AFB. I find that the action will have no significant impact on the quality of the human environment; thus, an Environmental Impact Statement is not warranted.

### **Finding of No Practicable Alternative**

Pursuant to EO 11988, and taking the above information into consideration, I find that there is no practicable alternative to this action and that the Proposed Action includes all practicable measures to minimize harm. In accordance with EO 11988, Section 2(a)(2), the Schriever AFB environmental section will send notice of the Proposed Action to the USACE.

This combined FONSI/FONPA was reviewed and approved by the members of the Environmental Protection Committee.

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MICHAEL D. SELVA  
Colonel, USAF  
Chairperson, Environmental Protection Committee  
Schriever AFB, Colorado

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Date

# EXECUTIVE SUMMARY





<b>Executive Summary Table</b> <b>Summary of Environmental Consequences</b>		
	<b>Proposed Action</b>	<b>No Action Alternative</b>
<b>Air Resources</b>		
<b>Air Emissions</b>	Short-term but not significant increase in air emissions; no long-term impact	No change in current level of emissions
<b>Geological Resources</b>		
<b>Geology &amp; Topography</b>	No impacts to geology due to soil depths; short-term but not significant impacts to topography from soil disturbance, no long-term impact	No impact to geology
<b>Soils</b>	Short-term but not significant disturbance to soils; no long-term impact	No new impacts to soils
<b>Water Resources</b>		
<b>Groundwater</b>	Boring holes and installing the proposed fence would not disturb the unconfined surficial aquifer. Impacts to groundwater would not be significant.	No impact to groundwater
<b>Surface Water</b>	No significant impacts to surface water from erosion or storm water runoff	No impact to surface water
<b>Floodplain</b>	Placing fence posts within the floodplain would negligibly affect the hydrology of the floodplain area and would not change the bottom elevation of the channel. No significant impacts would occur.	No impact to floodplain
<b>Biological Resources</b>		
<b>Vegetation</b>	Minimal impacts to vegetation from construction activities, not a significant impact	No impact to vegetation
<b>Wildlife</b>	Habitat alteration would be minor, some larger wildlife would be prevented from foraging or moving through the area, overall impacts are not significant	No impact to wildlife
<b>Threatened or Endangered Species</b>	No significant impacts to threatened or endangered species	No impact to threatened or endangered species
<b>Wetlands</b>	Following best management practices no siltation would impact wetlands, impacts would not be significant	No impact to wetlands
<b>Noxious Weeds</b>	Reestablishing vegetation after construction would minimize establishment of noxious weeds, impacts would not be significant	No change in noxious weed establishment

<b>Executive Summary Table</b> <b>Summary of Environmental Consequences</b>		
	<b>Proposed Action</b>	<b>No Action Alternative</b>
<b>Environmental Justice</b>		
Minority population & low income population	No impacts to minority populations, low-income populations, or children	No impacts to minority populations, low-income populations, or children
<b>Solid Waste</b>		
<b>Solid Waste</b>	Temporary increase in debris, not a significant impact to local landfills	No increase in solid waste generation

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# **ACRONYMS AND ABBREVIATIONS**



## ACRONYMS/ABBREVIATIONS

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AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AFH	Air Force Handbook
AFI	Air Force Instruction
APEN	Air Pollutant Emissions Notice
AQCR	Air Quality Control Region
CAA	Clean Air Act
CAAQS	Colorado Ambient Air Quality Standards
CEQ	Council on Environmental Quality
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
CNHP	Colorado Natural Heritage Program
CO	Carbon monoxide
DoD	Department of Defense
EA	Environmental Assessment
EO	Executive Order
°F	Degrees fahrenheit
FEMA	Federal Emergency Management Agency
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
HAP	Hazardous air pollutants
MSL	Mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO <sub>2</sub>	Nitrogen dioxide
NO <sub>x</sub>	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NWS	National Weather Service
O <sub>3</sub>	Ozone
Pb	Lead
PM <sub>10</sub>	Particulate matter 10 microns in diameter
PM <sub>2.5</sub>	Particulate matter 2.5 microns in diameter
ppm	Parts per million
PSD	Prevention of Significant Deterioration

SIP	State Implementation Plan
SO <sub>x</sub>	Sulfur oxide
SO <sub>2</sub>	Sulfur dioxide
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USBC	United States Bureau of Census
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground storage tank
VOC	Volatile organic compound

# **CHAPTER 1**

## **PURPOSE AND NEED FOR ACTION**



## 1. PURPOSE OF AND NEED FOR ACTION

---

This section includes an introduction and then describes the purpose and need for the action, and the location of the project area on Schriever Air Force Base (AFB), Colorado.

### 1.1 INTRODUCTION

The United States Air Force proposes to implement antiterrorism/force protection measures at Schriever AFB by constructing a security fence around the base's buffer zone. The *National Environmental Policy Act* (NEPA) of 1969, as amended, requires Federal agencies to consider environmental consequences in their decision-making process. The President's Council on Environmental Quality (CEQ) issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. The Air Force is preparing this environmental assessment (EA) through adherence to procedures set forth in the CEQ regulations (Title 40 Code of Federal Regulations (CFR) 1500-1508) and 32 CFR 989, 15 Jul 99, and amended 22 Apr 2003 (*Air Force Environmental Impact Analysis Process*). These Federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation, designed to ensure deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. This EA provides an analysis of potential environmental consequences that could result from the installation of the security fence.

### 1.2 PURPOSE AND NEED FOR ACTION

In accordance with Department of Defense (DoD) Instruction 2000.16, *DoD Combating Terrorism Standards*, Air Force Instruction (AFI) 31-101, *The Air Force Installation Security Program*, and Air Force Handbook (AFH) 32-1084 *Facility Requirements*, DoD installations are required to implement antiterrorism/force protection construction standards and to develop protective measures for DoD assets. Schriever AFB has chosen to implement antiterrorism/force protection measures, in accordance with AFH 32-1084 and AFI 31-101, by constructing a perimeter fence around their buffer zone. AFH 32-1084 states that "a fence serves as a legal and physical demarcation of a boundary. It is an obstruction which must be jumped, climbed, or cut through to gain entry. From a security and law enforcement point of view, such actions would be regarded as unauthorized entry. Signs are displayed at appropriate and regular intervals on the exterior boundary of the fence line or on posts immediately adjacent to the exterior boundary, describing the type of area and conditions for entry. This combination of fencing and signs is intended to discourage trespass or unauthorized entry to legal entry points."

The purpose of the action is to implement antiterrorism/force protection and increase security at Schriever AFB by constructing an eight-foot high chain link fence around the perimeter of the installation. Currently, there is a four-foot high barbed wire fence along the perimeter of the base. Type A fencing (the type specified as the Proposed



Action) is listed in AFH 32-1084 for areas of high mission value. Type B fence (such as the existing barbed wire fence) is typically used for a perimeter boundary for isolated portions of the base or as a livestock barrier. In light of an increased potential for terrorist activity in the United States, the proposed fence would increase security for personnel and military operations at the base.

The type of fence installed for any given use depends upon the degree of prevention and unauthorized entry desired. In accordance with AFH 32-1084, the factors that affect the selection of the type of security fencing to be used are:

Permanency of the need.

- Degree of prevention or deterrence of unauthorized entry desired.
- Physical layout of the installation or area and its immediate environs.
- Topography and climate.
- Nearness and nature of adjacent populated or built-up areas.
- Adjacent land use.
- Existing fencing or barriers.
- Degree of military control exercised in the areas immediately adjacent.
- Local threat assessment. Consider both criminal and terrorist threats.

### **1.3 LOCATION OF THE PROPOSED ACTION**

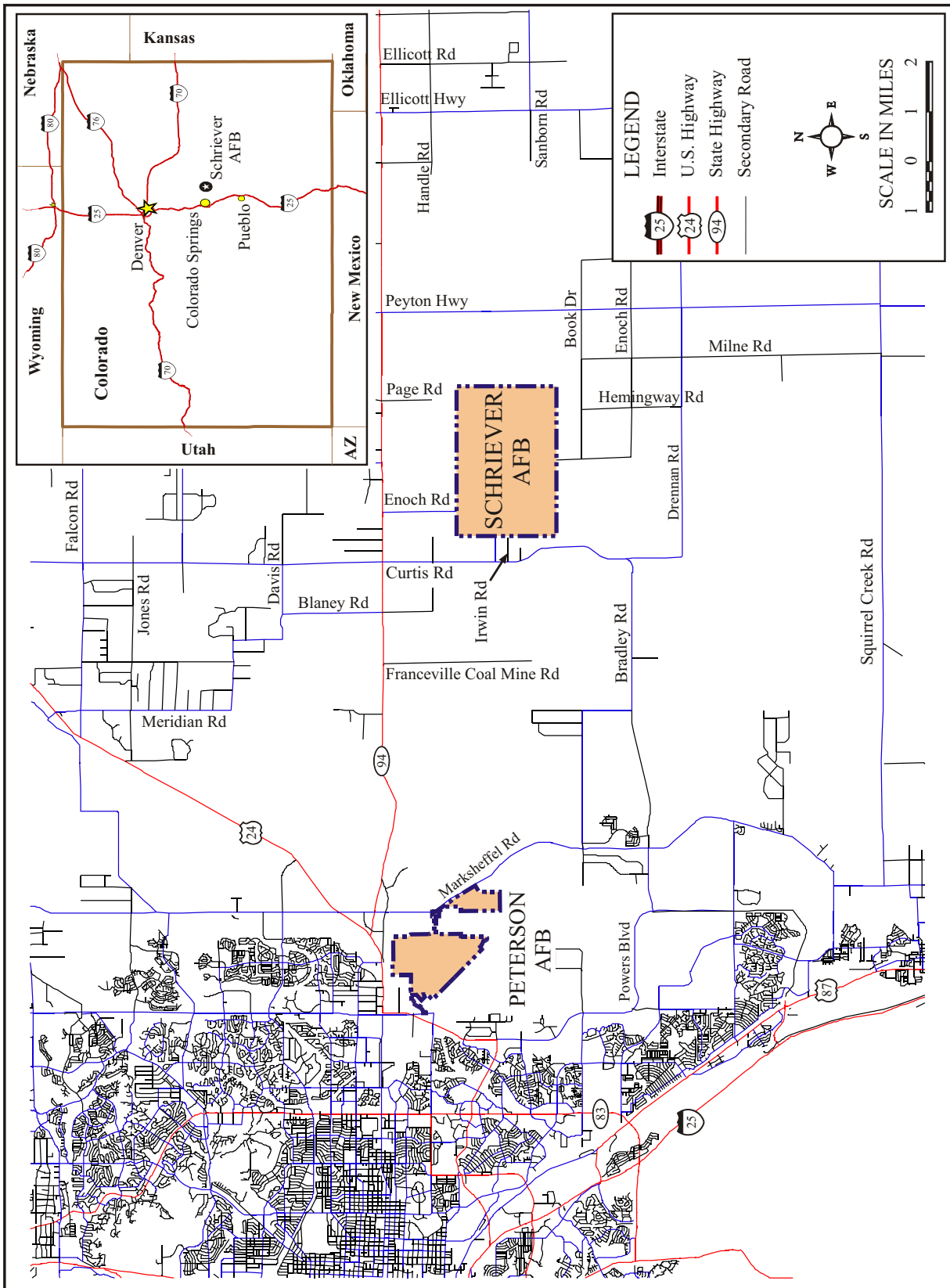
Schriever AFB, located approximately 10 miles east of Peterson AFB, was established in the mid-1980s (initially as Falcon AFB). The base consists of a secure area (640 acres) surrounded by a buffer two miles by three miles (a total of

3,840 acres). The base is accessed from Colorado Highway 94 via Enoch Road, or from Bradley Road via Irwin Road. Schriever AFB is surrounded by grasslands and ranches in a sparsely populated setting. Figure 1.1 shows the general location of Schriever AFB.

### **1.4 PUBLIC REVIEW PROCESS**

Scoping was conducted with representatives from Schriever AFB and Federal, state, and local agencies. Scoping letters and a copy of the Description of the Proposed Action and Alternatives were sent to the agencies listed in Section 6. Responses received from the agencies and a sample scoping letter are provided in Appendix A.

An advertisement was placed in the Colorado Springs Gazette on September 10, 2003 announcing the availability of the Draft EA and combined Draft Finding on No Practicable Alternative (FONPA)/Finding of No Significant Impact (FONSI) for public review (see Appendix A). The public comment period ran through October 9, 2003. No public comments were received.



**Figure 1.1 General Location of Schriever AFB**

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## **CHAPTER 2**

### **DESCRIPTION OF THE ALTERNATIVES INCLUDING THE PROPOSED ACTION**



## **2. DESCRIPTION OF THE ALTERNATIVES INCLUDING THE PROPOSED ACTION**

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This section describes the Proposed Action, No Action Alternative, and alternatives considered but eliminated from further analysis.

### **2.1 PROPOSED ACTION**

The Proposed Action is to enclose the entire base with an eight-foot high chain link fence with an outrigger on the top (see Figure 2.1). The total enclosed area would be 3,840 acres (six square miles); of this, 640 acres is developed land and the rest is a buffer zone that consists of shortgrass prairie.

The fence would be a seven-foot high, nine gauge steel wire fabric, chain-link fence with one outrigger (facing outward) with three strands of barbed wire. The overall height of the fence with outrigger would be eight feet. The fence would be constructed 15 inches inside an existing barbed wire fence, which is currently located 3 inches inside of the base perimeter. The distance between line posts of the proposed fence would not exceed 10 feet. Foundations for line posts, constructed of concrete, would be 12 inches in diameter with a minimum depth of 42 inches below grade. Foundations for terminal and gate posts would be 18 inches in diameter. The proposed fence would have a tension wire along the entire bottom of the chain link fabric and a top rail along the top of the fabric. Four-inch tension poles would be installed at every corner, transition point, or 150 feet (USAF, 2003a).

The existing barbed wire perimeter fence would be maintained until installation of the proposed new security fence is complete. The contractor would then remove the existing barbed wire

perimeter fence and recycle the materials as applicable.

There is an existing two track dirt perimeter road just inside the existing barbed wire fence around the installation (see Figure 2.1 and Photos 1 and 3). No upgrades to the road are planned as part of this proposal. However, depending on the proximity of the proposed fence to the existing road, the path of the road might need to be adjusted slightly. There are existing cattle guards located where the barbed wire fence runs perpendicular to the perimeter fence. No upgrades or new cattle guards are proposed as part of this action.

Where the fence would cross stream beds, one of two options would be implemented. The first option is to construct the fence (line posts and chain link fabric) following the contours, with the tension bar at the bottom of the fence at ground level. The second option is to construct a hanging wall up to four feet high with drainage holes or culverts (see Figure 2.2). The hanging wall would be constructed on concrete footers, and the fence would be constructed on top of the wall. The best option would be determined during the project design phase and would be based on an engineering analysis and the nature and expanse of the stream bed that the fence would cross over.

Once the proposed eight-foot fence is installed most wildlife such as antelope, coyote, and fox would no longer be able to enter and exit the installation. Currently wildlife enter and exit the installation under the existing barbed-wire fence. Base personnel would

coordinate with the Colorado Department of Wildlife to remove any wildlife trapped inside the installation after the fence is constructed. There are no major water sources or unique vegetation on the installation that would impact the food supply of the wildlife. There are abundant open areas surrounding the installation.

Photographs 1 through 4 show views of the existing fence, access road, vegetation, and antelope. These photographs were taken during a July, 2003 site visit.

## **2.2 NO ACTION ALTERNATIVE**

Under the No Action Alternative, antiterrorism/force protection measures would not be implemented to protect the base perimeter boundary at Schriever AFB. The existing barbed wire fence would be left in place.

## **2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION**

Two alternatives to constructing a security fence around the perimeter of the base were considered but eliminated from further consideration. The alternatives and reasons for their elimination are discussed below.

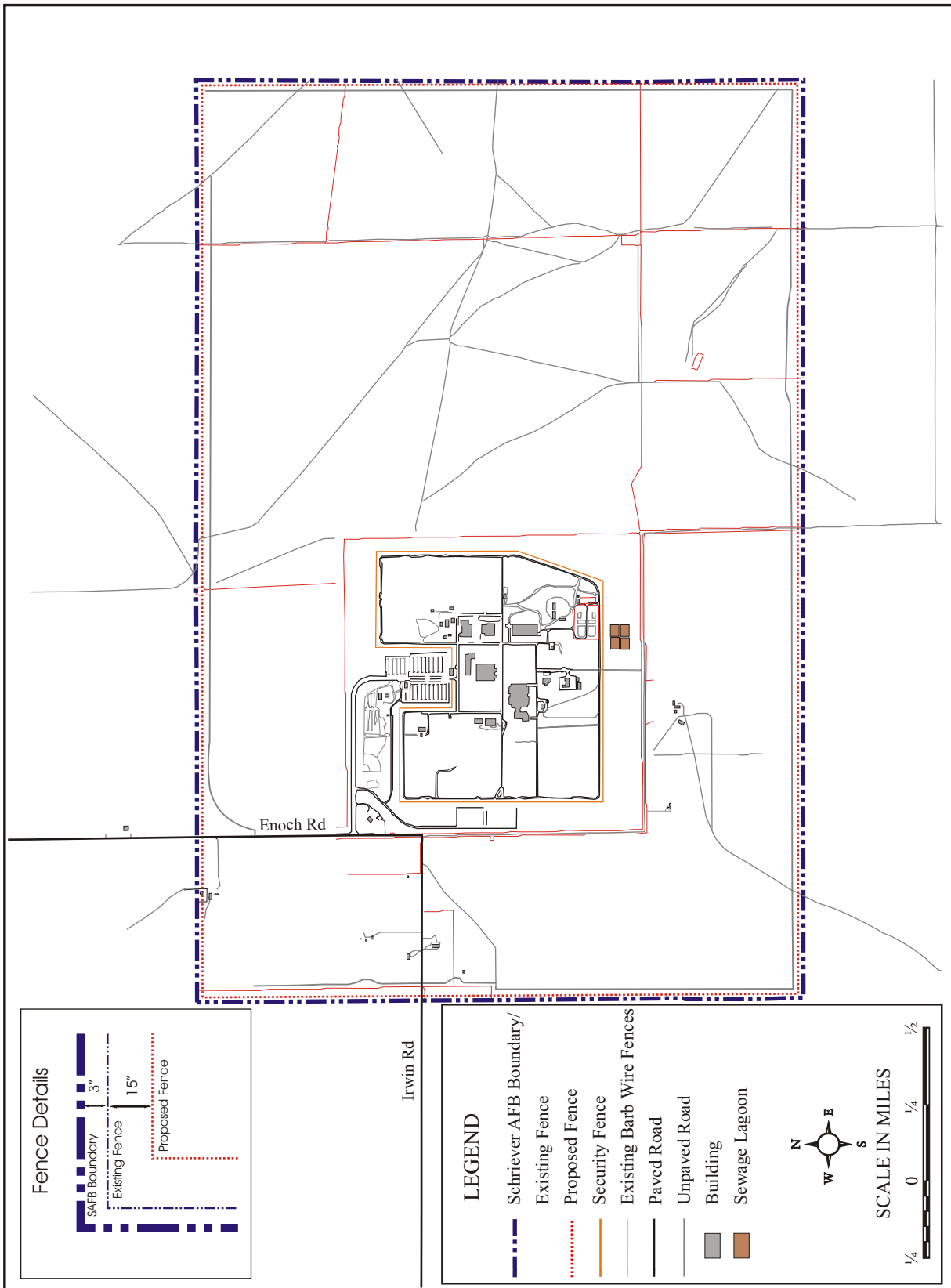
### **2.3.1 Install 8-Foot Chain Link Fence Around North, West, and South Sides of Base Perimeter**

An alternative to the Proposed Action is to install the fence (as described under the Proposed Action) around the north, west, and south sides of Schriever AFB. This alternative would leave the existing barb wire fence along the east side of the base. This alternative would allow wildlife access to the installation and

would leave the east side of the base open for potential future base expansion. Because the degree of security provided would be reduced by leaving the east side of the base open, this alternative was eliminated from further consideration.

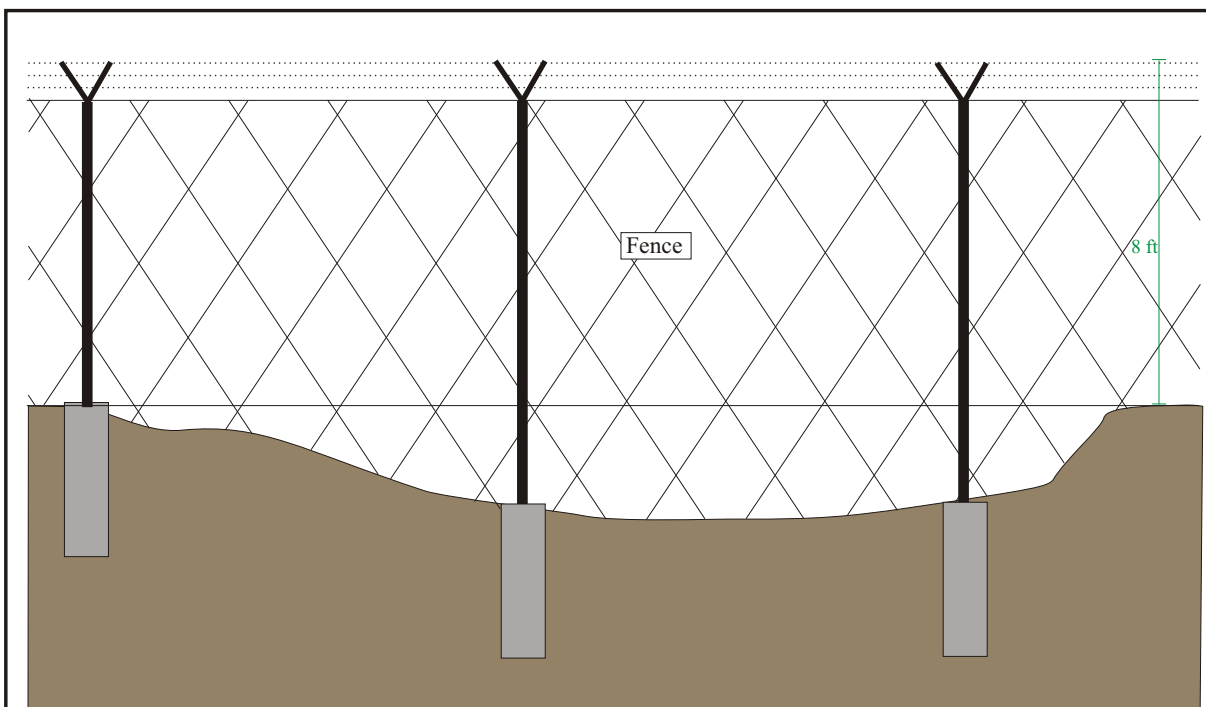
### **2.3.2 Install Security Cameras Along Perimeter of the Base**

An alternative to constructing a security fence around the base boundary is to install security cameras on poles every 200 feet around the perimeter of Schriever AFB. Monitored security cameras can detect intruders crossing a particular boundary or entering a protected zone. These cameras would have to be resilient enough to withstand outdoor weather conditions, such as extreme heat, cold, dust, rain, sleet, and snow. The camera's would require power supply cables to be installed to all of the cameras. A backup power system would also be required in the event of a power loss or in the event an intruder would try to "cut" power to the cameras. Although an allowable alternative under DoD Instruction 2000.16, this alternative was eliminated from further consideration due to the requirements for power supply cables to be installed over such an extensive area and the need for a backup power supply system.

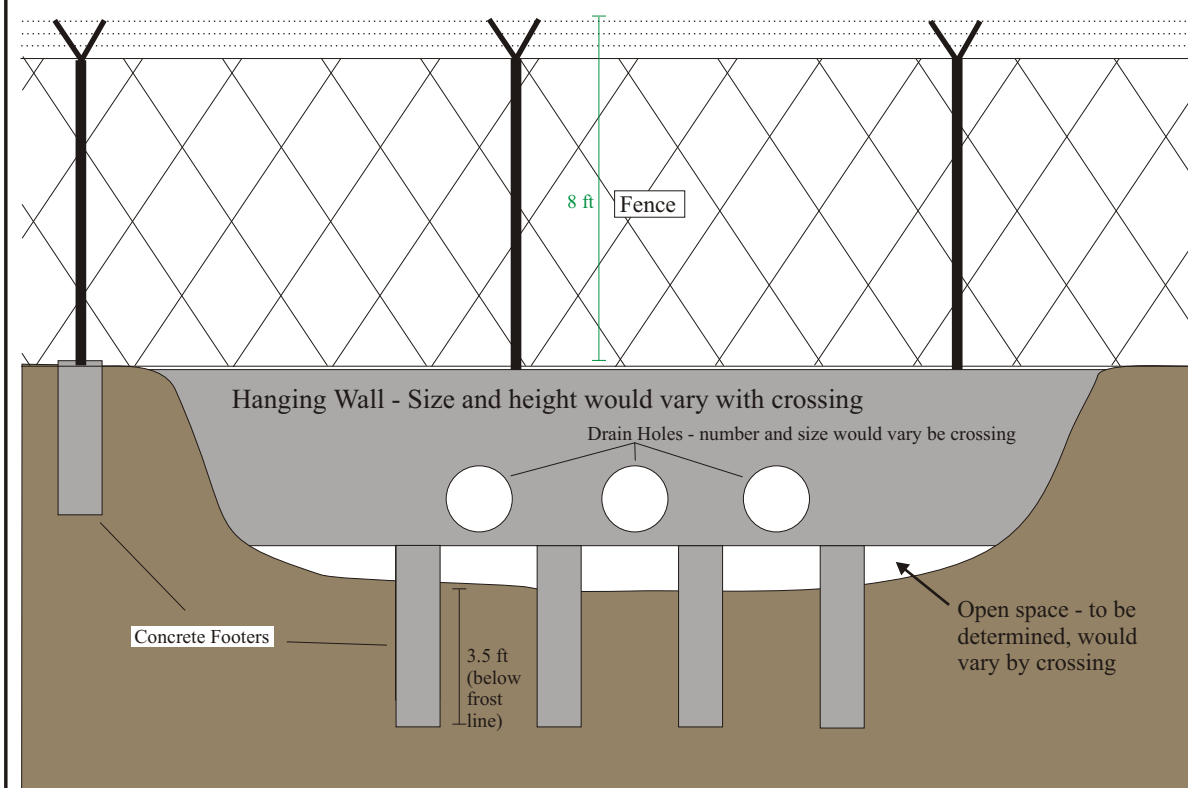


**Figure 2.1 Location of Project Area at Schriever AFB**





Option 1 Follow Ground Contours



Option 2 Construct Fence on Hanging Wall

**Figure 2.2 Proposed Crossings over Drainages**



**Photo 1. Looking South Along West Boundary of Schriever AFB**



**Photo 2. Looking North Along East Boundary of Schriever AFB**

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**Photo 3. Looking East to Northeast Corner of Schriever AFB**



**Photo 4. Antelope Just North of Schriever AFB**

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# **CHAPTER 3**

## **AFFECTED ENVIRONMENT**



### 3. AFFECTED ENVIRONMENT

---

This chapter describes the environment in the project area (as appropriate), providing baseline information to allow the evaluation of potential environmental impacts that could result from the Proposed Action and the No Action Alternative. As stated in 40 CFR Sec. 1508.14, the human environment includes natural and physical resources and the relationship of people to those resources. The environmental baseline resource areas described in this chapter were selected after identifying the potential issues and concerns of constructing the security fence. In accordance with 40 CFR Sec. 1502.15, the resource areas that would not be impacted are not carried forward for further analysis. These resource areas are listed below, with a brief explanation for their omission from the analysis.

**Noise.** Noise is defined as unwanted sound, or any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise would temporarily increase during installation of the new fence and removal of the old fence, but the action would occur away from the main buildings on base. There are no nearby inhabitants that would be affected and the impacts are not considered significant. The short-term increase in noise would not be significant and is not carried forward for further analysis.

**Cultural Resources.** Cultural resources are archaeological and historical items, places, or events considered important to a culture, community, tradition, religion, or science. Schriever AFB has been completely surveyed for historic and archaeological resources. Five separate

surveys were conducted between 1982 and 1997, to include Cold War historic sites. The surveys did not identify any significant sites within the boundaries of the base; therefore, cultural resources will not be further analyzed. Should unidentified archaeological resources be discovered during construction activities, work would halt until the resources could be evaluated in terms of the National Register criteria, 36 CFR 60.4, in consultation with the Colorado Historical Society.

**Socioeconomics.** Socioeconomics are defined as the basic attributes and resources associated with the human environment, particularly population, housing, and economic activity. There would be small beneficial impacts to local employment and income from construction of the security fence. Construction jobs would most likely be filled by persons already living in the area, no increase in population would occur. Overall impacts to the local economy would be small, but beneficial, and are not further analyzed.

**Visual Resources.** Visual resources are defined as the natural and manufactured features that constitute the aesthetic qualities of an area. These features form the overall impression that an observer receives of an area. The visual environment at Schriever AFB is characteristic of a military installation and the project area for the fence is removed from the main installation. Replacing the existing barbed-wire fence with a chain link fence, although visually different, would not significantly impact visual resources. Visual resources will not be further analyzed.



### **Hazardous Materials and Wastes.**

Hazardous materials are substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present a substantial danger to public health or the environment if released. The use or release of a hazardous material usually results in the generation of a hazardous waste. Only non-hazardous waste generation would occur from construction and demolition (concrete and barbed wire) of the fencing. There would be no building demolition required to construct the fence; therefore, lead-based paint and asbestos are not an issue. Hazardous materials and wastes will not be further analyzed.

The resource areas that may be impacted by the Proposed Action or No Action Alternative include air, geology and soils, water resources, biological resources, environmental justice, and solid waste. The order of resource description is based on introducing the physical environment (air, geology, and water), the natural environment (biology), the human environment (environmental justice), and concludes with solid waste. A brief summary of applicable laws and regulations that may be applicable to the Proposed Action is provided in Appendix A.

## **3.1 AIR RESOURCES**

This section discusses the climate and meteorology of the area, air quality standards, existing air pollutant sources, and regional air quality. The air quality of an area at any given time depends on the meteorological conditions (temperature, wind speed and direction, and temperature inversions), the amount and type of pollutants in the atmosphere, and the geographic setting of the area (in

particular, features such as mountains or basins which inhibit the dispersion of pollutants). Pollutant concentrations are generally highest with a calm atmosphere or with a strong temperature inversion, where pollutants are trapped near the surface by warm air aloft. These conditions are more common in the autumn and winter.

### **3.1.1 Climate and Meteorology**

Schriever AFB is located near the border of the Great Plains and the Front Range of the Rocky Mountains, which results in a moderate semi-arid climate. The average July temperature is 70° F and the average January temperature is 28° F. The area is subject to thunderstorms and heavy rainfall, which primarily occur from May through August. Mean precipitation is about 17.40 inches per year. Most rain occurs from March through September, with peak rainfall occurring in August (NWS, 2003). The most rainfall in a 24 hour period was 3.98 inches which occurred in August 1999. Total annual potential evaporation is about 25 inches. Net annual precipitation (precipitation minus evaporation) is minus 9 inches (potential evaporation exceeds annual rainfall). Relative humidity ranges from about 55 percent in early morning to 35 percent in the early afternoon. Prevailing winds are predominantly from the north throughout the year. Wind speeds usually range from 7 to 10 knots (8 to 12 miles per hour), with the highest speeds occurring in the spring and the lowest in late summer and early fall.

### **3.1.2 Air Quality Standards**

The National Ambient Air Quality Standards (NAAQS), established by the United States Environmental Protection

Agency (USEPA), and adopted by the Colorado Department of Public Health and Environment (CDPHE), define the maximum allowable concentrations of pollutants that may be reached but not exceeded within a given time period. These standards were selected to protect human health with a reasonable margin of safety. Section 110 of the Clean Air Act (CAA) requires states to develop air pollution regulations and control strategies to ensure that state air quality meets the NAAQS established by USEPA. These ambient standards are established under Section 109 of the CAA, and they currently address six criteria pollutants. These pollutants are: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), lead (Pb), particulate matter, and sulfur dioxide (SO<sub>2</sub>). Each state must submit these regulations and control strategies for approval and incorporation into the Federally enforceable State Implementation Plan (SIP). Exceeding the concentration levels within a given time period is a violation, and constitutes a nonattainment of the pollutant standard.

Particulate matter has been further defined by size. There are standards for particulate matter smaller than 10 microns in diameter (PM<sub>10</sub>) and smaller than 2.5 microns in diameter (PM<sub>2.5</sub>). Table 3.1-1 presents the current NAAQS and the Colorado Ambient Air Quality Standards (CAAQS) for the six criteria pollutants.

Generally, criteria pollutants directly originate from mobile and stationary sources. Tropospheric O<sub>3</sub> is an exception, since it is rarely directly emitted from sources. Most O<sub>3</sub> forms as a result of volatile organic compounds (VOC) and nitrogen oxides (NO<sub>x</sub>) reacting with sunlight. In 1997, an eight-

hour average standard of 0.08 parts per million (ppm) was adopted to replace a one-hour standard. The one-hour standard for ozone of 0.12 ppm was retained as a transition to the new eight-hour standard for those areas that were in nonattainment.

All areas of the country are classified as attainment, nonattainment, or unclassifiable. Areas which meet the national primary and secondary ambient air quality standards are classified as attainment. Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for any criteria pollutant is designated as nonattainment. Areas in nonattainment of ambient air quality standards must develop a Nonattainment Plan to achieve attainment, as outlined in Section 172 of the CAA. These plans are usually a revision of the SIP for achieving air quality standards.

When the USEPA certifies that a nonattainment area has achieved attainment of the NAAQS, the area is redesignated as attainment. "Each State which submits a request under Section 107(d) for redesignation of a nonattainment area for any air pollutant as an area which has attained the national primary ambient air quality standard for that air pollutant shall also submit a revision of the applicable SIP to provide for the maintenance of the national primary ambient air quality standard for such air pollutant in the area concerned for at least 10 years after the redesignation. The maintenance plan shall contain such additional measures, if any, as may be necessary to ensure such maintenance" (42 U.S.C. Sec. 7505).

<b>Table 3.1-1</b> <b>National Ambient Air Quality Standards (NAAQS)</b> <b>and Colorado Ambient Air Quality Standards (CAAQS)</b>				
<i>Pollutant</i>	<i>Averaging Time</i>	<i>NAAQS</i> <i>µg/m<sup>3</sup> (ppm)<sup>a</sup></i>		<i>CAAQS</i>
		<i>Primary<sup>b</sup></i>	<i>Secondary<sup>c</sup></i>	
O <sub>3</sub>	1 hr 8 hr	235 (0.12) <sup>d</sup> 157 (0.08)	Same Same	Same
CO	1 hr 8 hr	40,000 (35) 10,000 (9)	None None	Same
NO <sub>2</sub>	AAM <sup>e</sup>	100 (0.053)	Same	Same
SO <sub>2</sub>	3 hr 24 hr AAM	None 365 (0.14) 80 (0.03)	1,300 (0.5) none none	700 µg/m <sup>3</sup> 100 µg/m <sup>3</sup> 15 µg/m <sup>3</sup>
PM <sub>10</sub>	AAM 24 hour	50 150	Same Same	Same Same
PM <sub>2.5</sub>	AAM 24 hr	65 15	Same Same	None
Pb	¼ year	1.5	Same	Same
<sup>a</sup> µg/m <sup>3</sup> — micrograms per cubic meter; ppm — parts per million <sup>b</sup> National Primary Standards establish the level of air quality necessary to protect the public health from any known or anticipated adverse effects of a pollutant, allowing a margin of safety to protect sensitive members of the population. <sup>c</sup> National Secondary Standards establish the level of air quality necessary to protect the public welfare by preventing injury to agricultural crops and livestock, deterioration of materials and property, and adverse impacts on the environment. <sup>d</sup> On June 26, 2003, the EPA took final action to stay its authority to determine that the 1-hour national ambient air quality standard for ozone no longer applies in areas that meet that standard. Under the previous EPA rule, EPA could determine that the 1-hour standard no longer applied to an area upon finding that the area has met that standard. This final stay ensured that the 1-hour standard remains in place nationwide until EPA issues a new rule governing how and when the 1-hour standard should be removed. <sup>e</sup> AAM —Annual Arithmetic Mean. PM <sub>10</sub> is particulate matter equal to or less than 10 microns in diameter PM <sub>2.5</sub> is particulate matter equal to or less than 2.5 microns in diameter. Source: 40 CFR 50; Code of Colorado Regulations, Title 5, Chapter 1001, Regulation 14				

Proposed Federal actions within a nonattainment or maintenance area must conform to the SIP. Conformity thresholds, as defined in 40 CFR 51, Subpart W, are used to determine conformity of an action with a SIP. The thresholds are determined by nonattainment or maintenance status. For nonattainment areas, the thresholds are determined by the severity of nonattainment. For maintenance areas,

the thresholds are 100 tons per year of CO, NO<sub>x</sub>, sulfur oxides (SO<sub>x</sub>), and particulate matter. The threshold for VOC is 50 tons per year if the maintenance area is inside an ozone transport region or 100 tons per year if the maintenance area is outside an ozone transport region. These provisions are known as the General Conformity Rule.

The intent of conformity requirements is to ensure that Federal actions do not

significantly affect the timely attainment and maintenance of air quality standards. As stated in Section 176 (c) (1) of the CAA (U.S.C. Sec. 7505a) “No department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity which does not conform to an implementation plan after it has been approved or promulgated under Section 110. The assurance of conformity to such an implementation plan shall be an affirmative responsibility of the head of such department, agency, or instrumentality. Conformity to an implementation plan means conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards; and that such activities will not cause or contribute to any new violation of any standard in any area; increase the frequency or severity of any existing violation of any standard in any area; or delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.” The CAA and USEPA have set specific guidelines and procedures for determining whether Federal actions conform to SIPs (including conformity thresholds). These procedures allow for flexibility by the states and regional USEPA offices in determining if a Federal action conforms with the applicable SIP.

Hazardous air pollutants (HAPs) are regulated under 40 CFR 61, *National Emission Standards for Hazardous Air Pollutants (NESHAP)* and 40 CFR 63, *NESHAP for Source Categories*. A major source, defined as one emitting, or having the potential to emit, 10 tons per

year of any single HAP or 25 tons per year total HAPs, requires a permit, and as specified in 40 CFR 63, the implementation of maximum achievable control technology. A minor source is defined as one emitting, or having the potential to emit, less than 10 tons per year of any single HAP or 25 tons per year total HAPs.

### 3.1.3 Air Pollutant Sources

Particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) is generated during ground disturbing activities and during combustion. El Paso County requires an air quality permit for fugitive particulate emissions from disturbed ground of more than one acre in size. If this ground is disturbed for more than 6 months, and is 25 acres or more in size, a Colorado Air Pollutant Emissions Notice (APEN) is also required. Limits for other criteria pollutants apply only to permanent stationary sources installed during construction. These limits are specified for attainment or nonattainment areas (*Code of Colorado Regulations*, Title 5, Chapter 1001, Regulation 3, Part A, II.B.62.a) and are two tons per year of any pollutant in an attainment area.

The principal source of CO and SO<sub>2</sub> is combustion. The precursors of O<sub>3</sub> (VOC and NO<sub>x</sub>) are also primarily emitted from combustion. Emissions of CO, SO<sub>2</sub>, VOC, and NO<sub>x</sub> are generated at Schriever AFB by mobile sources, such as motor vehicles, construction equipment, and stationary sources, such as boilers and generators. VOCs are also emitted by vehicle refueling, storage tanks, and other stationary sources.

HAPs include a wide range of materials or chemicals that are toxic or potentially harmful to human health. While HAPs

are found in numerous products and used in many processes, few types and small amounts of HAPs are generated during internal combustion processes or earth-moving activities. The largest source of HAPs at Schriever AFB is chemical usage for maintenance of equipment. HAPs are also generated by diesel generators, boilers, fuel storage tanks at the AAFES Service Station, the cooling tower, and vehicle refueling (USAF, 2002c).

### 3.1.4 Regional Air Quality

Schriever AFB is located in the Colorado Springs Metropolitan Area, which lies within the San Isabel Intrastate Air Quality Control Region (AQCR). The Colorado Springs Metropolitan Area is currently in attainment for all criteria pollutants, but has only been in attainment for CO since August 1999 (CAQCC, 2000). As part of the redesignation as an attainment area, the Colorado Springs area is under a maintenance plan (effective October 25, 1999) for 10 years to demonstrate compliance with the CO standard, as provided for in Section 110 of the CAA (42 U.S.C. Sec. 7410). Under this maintenance plan, implemented under a SIP and approved by the USEPA, the Colorado Springs Maintenance Area has a budget of 270 tons per day (98,550 tons per year) of CO. The Colorado Springs Metropolitan Area is in maintenance for CO, but in attainment for other criteria pollutants; the conformity with the SIP is focused on CO.

Schriever AFB completed an Air Emissions Inventory for calendar year 2001 (USAF, 2002). The installation-wide criteria pollutant totals (actual and potential emissions) are shown in Table 3.1-2.

Actual emissions were calculated with emission factors and actual usage times for equipment. As defined in 40 CFR 52.21, the potential to emit is the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. For purposes of potential to emit calculations, operating hours for emergency equipment (such as emergency generators) is limited to 500 hours per year by the USEPA. A Construction Permit for Schriever AFB to add 4 new generators was initially approved by the Colorado Air Pollution Control Division May 1, 2003 and is valid until March 28, 2008 (CDPHE, 2003). This permit regulates the operation of stationary sources at the base (4 boilers and 14 diesel generators). Operation of the AAFES gas station storage tanks is regulated by a separate permit obtained by AAFES. Schriever AFB is a synthetic minor stationary source, as the basewide potential to emit any criteria pollutant does not exceed 100 tons per year. The base is currently working on obtaining a CAA Title V operating permit because the potential to emit NO<sub>x</sub> has been recently estimated at 94.49 tons per year (67.57 tons per year from permitted sources), and a Title V permit would give Schriever AFB room for future growth (DeGarmo, 2003).

Schriever AFB is not subject to Prevention of Significant Deterioration (PSD) review requirements of 40 CFR 52.21 and Code of Colorado Regulations, Title 5, Chapter 1001, Regulation 3, Part B, Section IV.D.3 because the actual or potential emissions of any criteria pollutant does not exceed 250 tons per year.

The primary stationary source of PM<sub>10</sub> at Schriever AFB is fugitive dust from construction. Most of the NO<sub>x</sub>, SO<sub>2</sub>, and

<b>Table 3.1-2</b> <b>Installation-Wide 2001 Air Pollutant Emissions at Schriever AFB</b> <b>(values in tons per year)<sup>1</sup></b>						
Emissions <sup>2</sup>	<i>PM<sub>10</sub></i>	<i>SO<sub>x</sub></i>	<i>NO<sub>x</sub></i>	<i>VOCs</i>	<i>CO</i>	<i>HAPs</i>
Stationary Sources, Actual	16.97	2.11	12.61	1.48	6.20	0.560
Stationary Sources, Potential	35.55	10.11	88.20 <sup>3</sup>	4.88	28.91	1.316
<sup>1</sup> These values include both permitted and non-permitted sources. <sup>2</sup> PM <sub>10</sub> emissions include 32.40 tons per year from construction emissions (a stationary fugitive source). <sup>3</sup> The potential to emit NO <sub>x</sub> was estimated to be 94.49 tons in March 2003. The potential to emit other criteria pollutants was not assessed at this time. Source: USAF, 2002c						

CO emissions are generated by diesel generators and natural gas boilers, furnaces, and heaters. Most of the VOCs are emitted from gasoline storage tanks and refueling (USAF, 2002c). Most of the VOCs from storage tanks and refueling is from gasoline operations, primarily three 12,000 gallon underground storage tanks (UST) at the AAFES service station. These tanks are regulated under an APEN.

Schriever AFB is a minor source of HAPs, with actual emissions of 0.56 tons per year. HAPs emissions are below the thresholds for specific requirements under 40 CFR 61 and 63 for source categories. The base monitors the amount of HAP emissions and reports them to the State of Colorado. Most of the HAP emissions are generated by chemical usage in maintenance shops (USAF, 2002c).

### 3.2 GEOLOGICAL RESOURCES

Geological resources discussed in this section include physical features of the earth such as geology (surface and subsurface features), topography, and soils.

#### 3.2.1 Geology and Topography

The project area is situated in the Colorado Piedmont section of the Great Plains Physiographic Province. The Southern Rocky Mountain Physiographic Province is located about 18 miles to the west. The Colorado Piedmont is a mature elevated plain, dissected by numerous streams. In the local area, this includes Chico and Black Squirrel Creeks and their tributaries.

Elevations in the project area range from about 6,370 near the northwest corner of the base to 6,090 feet above mean sea level (MSL) in the southeast corner and generally slope to the south and southeast at 1 to 6 percent grades. Areas near stream beds are steeper, with slopes of up to 50 percent.

The project area is underlain by about 25 to 100 feet of Quaternary alluvium (primarily sand and gravel) from tributaries of the Arkansas River (EPCPD, 2003). These deposits are underlain by the Arapahoe Formation which consists of a 400 to 700 foot-thick sequence of interbedded conglomerate, sandstone, siltstone, and shale (the thickness of the Arapahoe Formation is around 50 to 100 feet near Schriever AFB, due to the base's location near the edge of the Denver Aquifer System). The deposits of the

Laramie and Fox Hills Formations underlie the Arapahoe Formation. The Laramie Formation (500 to 600 feet thick) is composed of sandstone and shale. The sandstone is fine to medium, friable, and carbonaceous. The Fox Hills Formation is comprised of sandstone and siltstone interbedded with shale. Pierre Shale underlies the Laramie-Fox Hills Formation (USGS, 1995a). Deposits of sand and gravel are common in El Paso County. However, most of these are unsuited for commercial use and are rated as poor for fill material (USDA, 1981).

There are no major faults in the Colorado Springs vicinity; the nearest major faults are located about 80 to 100 miles from the area. The Sangre de Cristo Fault, with a characteristic magnitude (the anticipated magnitude of an earthquake based on fault geology and stress in the fault) of 7.5, is located about 85 miles southwest of the project area. The Sawatch Range Fault, with a characteristic magnitude of 7.2, is located about 95 miles southwest of the project area. The Cheraw Fault, with a characteristic magnitude of 7.1, is located about 95 miles southeast of the project area (USGS, 2000). The project site is located in Zone 1 for potential earthquake damage, with slight damage anticipated from any seismic event (USAF, 1992), with expected magnitudes in the range of 4.0 to 4.4 on the Richter Scale (V to VI on the Modified Mercalli Scale). Earthquakes of this magnitude would typically cause breakage of windows or plaster or other slight damage. Since 1973, there have been 12 earthquakes within 100 kilometers (62 miles) of the site, with magnitudes ranging from 2.5 to 4.0 (USGS, 2003).

### **3.2.2 Soils**

Soils in the project area were formed in arkosic (derived from quartz and feldspar-

rich granite) sedimentary rocks derived from windblown and stream-deposited sediment. Soils at Schriever AFB are predominately Ascalon sandy loam, Blakeland loamy sand, and Bresser sandy loam, with relatively small areas of Blendon sandy loam, Ellicott loamy coarse sand, Keith silt loam, Sampson loam, Truckton loamy sand, and Truckton sandy loam soil series. Physical properties of these soils are listed in Table 3.2-1.

The depth to the water table is greater than 6 feet in all of the project area soils.

Ellicott soils occur on stream terraces and floodplains and experience frequent, brief flooding from March through July. On Schriever AFB, these soils occur within and near the southern part of an intermittent drainage flowing south from near the eastern edge of the secure area of the base. Ascalon soils are widespread on base, occurring in and near intermittent drainages and on slopes and uplands. Blakeland and Bresser soils are also widespread, occurring on slopes and upland areas. Other soils on base are limited in their occurrence on slope and upland areas. Slopes are generally slight to moderate, from 1 to 9 percent, but steeper slopes (up to 50 percent or higher) occur near stream banks. The Ascalon, Blendon, Bresser, Keith, Sampson, and Truckton soils are well drained; water is removed from the soil readily, but not rapidly. Internal free water occurrence commonly is very rare or very deep. The Blakeland and Ellicott soils are somewhat excessively drained; water is removed from the soil rapidly, and internal free water occurrence is deep or very deep (USDA, 1981). The shrink-swell potential, a measure of potential changes in soil volume due to varying moisture conditions, is low to moderate.

Permeability of the soils at Schriever AFB is moderate to rapid and runoff is slow to moderate. However, in brief heavy storms, runoff is greater, and due to the texture of the soils, overland flow can cause erosion in areas where vegetation is disturbed. Most of the soils have a moderate to severe hazard of erosion (see Table 3.2-2). Development of buildings and facilities at Schriever AFB has resulted in increasing amounts of impermeable surface which has increased the potential for erosion within and near developed areas. Overgrazing on the eastern half of the base has also increased the potential for erosion in some areas.

The Ascalon, Blakeland, Bresser, and Sampson soil series all have soil inclusions (areas of soil too small to be mapped

separately) with different physical properties. Included in the Ascalon series is the Olney sandy loam, Vona sandy loam, and Fort Collins sandy loam. The Olney and Vona soils have a severe hazard of wind blowing. The Fort Collins soil rarely floods. The Blakeland series has an inclusion of Stapleton sandy loam, with similar properties. The Bresser series has inclusions of Fort Collins loam described above and Yoder gravely sandy loam. The Yoder soil is a deep, well-drained soil with moderately rapid permeability, slow surface runoff, and a slight risk of erosion by water and a moderate hazard of wind blowing. The Sampson series also has inclusions of the Olney and Vona series.

Table 3.2-1 Soil Characteristics at Schriever AFB				
Soil Series	Location	Texture	Shrink-Swell <sup>1</sup>	Flooding
<b>Ascalon</b> 1 – 9 % slope	Uplands	0-8 in: sandy loam 8-22 in: sandy clay loam 22-60 in: sandy loam and loamy sand	Low-Moderate	None
<b>Blakeland</b> 1 – 9 % slope	Uplands	0-11 in: sandy loam 11-27 in: loamy sand 27-60 in: sand	Low	None
<b>Blendon</b> 0 – 3 % slope	Alluvial Fans and Terraces	0-10 in: sandy loam 10-26 in: sandy loam 26-60 in: gravely sandy loam	Low	None
<b>Bresser</b> 0 – 5 % slope	Terraces and Uplands	0-5 in: sandy loam 5-31 in: sandy clay loam 31-60 in: loamy coarse sand	Low	None
<b>Ellicott</b> 0 – 5 % slope	Terraces and Floodplains	0-4 in: coarse sand 4-60 in: coarse sand	Low	Frequent (Brief Duration, Mar-Jul)
<b>Keith</b> 0 – 3 % slope	Uplands	0-8 in: silt loam 8-22 in: silty clay loam 22-60: silt loam	Low-Moderate	None
<b>Sampson</b> 0 – 3 % slope	Terraces and Alluvial Fans	0-6 in: loam 6-44 in: clay loam to sandy clay loam 44-60 in: sandy clay loam	Low-Moderate	None
<b>Truckton</b> loamy sand 1 – 9 % slope	Uplands	1-8 in: loamy sand 8-18 : sandy loam 18-60 in: coarse sandy loam	Low	None
<b>Truckton</b> sandy loam, 3 – 9 % slope	Uplands	0-8 in: sandy loam 8-16 in: sandy loam 16-60 in: coarse sandy loam	Low	None
<sup>1</sup> The shrink-swell potential is a measure of the volume change from dry to wet conditions. A low shrink-swell potential is a volume change of less than 3 percent, a moderate potential is a volume change of 3 to 6 percent.				



<b>Table 3.2-2</b> <b>Drainage and Potential Erosion of Soils at Schriever AFB</b>					
<b>Soil Series</b>	<b>Permeability</b>	<b>Runoff</b>	<b>Water Erosion Hazard</b>	<b>Wind Erosion Hazard</b>	<b>Hydrologic Group<sup>1</sup></b>
<b>Ascalon</b> 1 – 9 % slope	Moderate (0.6-6 inches per hour)	Slow	Moderate	Moderate	B
<b>Blakeland</b> 1 – 9 % slope	Rapid (6-20 inches per hour)	Slow	Moderate	Severe	A
<b>Blendon</b> 0 – 3 % slope	Moderately Rapid (2-6 inches per hour)	Slow	Moderate	Moderate	B
<b>Bresser</b> 0 – 5 % slope	Moderate (.6-20 inches per hour)	Slow	Slight-Moderate	Moderate	B
<b>Ellicott</b> 0 – 5 % slope	Rapid (6-20 inches per hour)	Slow	High	Moderate	A
<b>Keith</b> 0 – 3 % slope	Moderate (.6-2 inches per hour)	Slow	Moderate	Slight	B
<b>Sampson</b> 0 – 3 % slope	Moderate (.6-2 inches per hour)	Slow	Slight	Slight	B
<b>Truckton</b> loamy sand 1 – 9 % slope	Moderately Rapid (2-6 inches per hour)	Slow	Moderate-High	Severe	B
<b>Truckton</b> sandy loam 3 – 9 % slope	Moderately Rapid (2-6 inches per hour)	Slow-Medium	Moderate	Severe	B
<sup>1</sup> Hydrologic groups are based on runoff and infiltration characteristics. Group A soils have low runoff and high infiltration. Group B soils have moderate runoff and infiltration. Source: USDA, 1981					

### 3.3 WATER RESOURCES

Water resources include surface and groundwater sources, quantity, and quality. The hydrologic cycle results in the transport of water into various media such as the air, the ground surface, and subsurface. Natural and human-induced factors determine the quality of water resources. Water resources discussed in this section include groundwater, surface water (including storm water runoff), and floodplains.

#### 3.3.1 Groundwater

The area's principal unconfined aquifer is in the alluvial sediments of the Chico and Black Squirrel Creeks. This shallow aquifer ranges in depth from 25 feet to more than 100 feet (EPCPD, 2003). This aquifer is hydraulically isolated from the

Denver Basin aquifer system by an impermeable layer between the alluvium and formations comprising the Denver Aquifer System. Groundwater in this aquifer flows to the south towards Chico Creek and east toward Black Squirrel Creek.

Colorado Springs lies on the southern edge of the Denver Basin Aquifer System. The aquifer system underlies an area of about 7,000 square miles that extends from Greeley south to near Colorado Springs and from the Front Range east to near Limon. This system is comprised of four aquifers (Dawson, Denver, Arapahoe, and Laramie-Fox Hills) in five geologic formations and is up to 3,000 feet thick. These formations are deepest in the central part of the aquifer, and shallow near the edges, outcropping in concentric circles at the edges of the Denver Basin. At the outer edge of the system lies the Laramie-

Fox Hills Aquifer, which underlies Schriever AFB. The Arapahoe Aquifer also underlies Schriever AFB. The Denver Aquifer underlies about 32 acres of the northern edge of Schriever AFB and the Dawson Aquifer is about nine miles to the north (EPCPD, 2003; USGS, 1995a).

The Arapahoe Formation consists of up to 700 foot-thick sequences of interbedded conglomerate, sandstone, siltstone, and shale. The thickness of this formation near Schriever AFB is about 50 to 100 feet. It contains the Arapahoe aquifer (which ranges in depth from 0 to 400 feet throughout the aquifer system). In the vicinity of Schriever AFB, the Arapahoe Aquifer underlies the alluvial sediments of the Chico and Black Squirrel Creeks, at a depth of 25 to 100 feet. Water in the Arapahoe aquifer generally is a sodium bicarbonate or sodium sulfate type. The dissolved-solids concentrations of the water generally range from 200 to 400 milligrams per liter in the vicinity of Schriever AFB. The Laramie-Fox Hills Aquifer underlies the Arapahoe Formation and varies between 50 and 300 feet in thickness and is 150 to 250 feet deep in the vicinity of Schriever AFB (USGS, 1995a). Water yields in the Laramie-Fox Hills Aquifer are low, and therefore have not been used extensively as water supplies. Water taken from some areas of the Laramie-Fox Hills aquifer can be of marginal value due to oxygen deficient conditions which give rise to hydrogen sulfide and methane gases (USGS, 1995a). The Denver Basin is recharged principally by the downward percolation of only a small part of the area's precipitation (USGS, 1995a). Hydraulic conductivity (how fast the water moves through the aquifer) in the Arapahoe Aquifer is between 0 and 100 feet squared per day in the vicinity of the base. Hydraulic conductivity in the Laramie-Fox Hills

Aquifer near the project area is less than 0.5 feet squared per day. Groundwater flow in both of these aquifers is toward the north-northeast (USGS, 1995a).

Most water wells in the project area obtain water from the alluvial aquifers. Some wells draw water from the Arapahoe and Laramie-Fox Aquifers. In 2000, there were about 57 water wells (off-base) within a mile of Schriever AFB and 7 on-base wells. These wells were used for stock watering and domestic supply (EPCPD, 2003). Schriever AFB obtains its water supply from 12 wells drawing water from the alluvial aquifer of the Black Squirrel Creek.

### **3.3.2 Surface Water**

Schriever AFB is located in a semi-arid environment which is typified by a limited number of perennial streams (those with water flows above the stream bed year round), and an abundance of intermittent and ephemeral streams. Intermittent streams are characterized by a water flow above the stream bed in some portions of the stream or during some months of the year, where the water table is above the level of the stream bed. Ephemeral streams are not connected with the water table, but flow only during or after precipitation or snowmelt. The water level in ephemeral streams often rises quickly and causes substantial erosion or deposition of sediment.

Schriever AFB lies within the Chico Creek Watershed (USGS hydrologic unit catalog 11020004), which drains into the Arkansas River (located about 35 miles to the south of the project area). Chico Creek, an intermittent stream, heads about 1.7 miles southwest of the base and flows into the Arkansas River. Black Squirrel Creek, an intermittent stream, heads about 15 miles northwest of the base, flows about 6 miles

east of the base, and flows into Chico Creek about 25 miles south of the base. On-base, there are three streams defined by the USGS as intermittent. Two of these streams flow from north to south through the secure area and then south of Schriever AFB (see Figure 3.1). The other intermittent stream, a tributary of the West Fork of the Black Squirrel Creek, heads about 2 miles north of Schriever AFB and flows just inside the northeast corner of the base before joining Black Squirrel Creek southeast of the base. These intermittent streams have cut channels as deep as 15 feet from the surrounding land (USAF, 2003c). They flow about 7 miles south of the base where they discharge into the ground near Chico Creek (EPCPD, 2003; USGS, 1975; USGS, 1961).

Thunderstorms can result in stream flows of several thousand cubic feet per second in these channels, causing temporary flooding of these waterways. The stream bed and banks are susceptible to erosion as they are comprised of sand with little or no vegetation. Culverts have been constructed in these drainages in the improved and semi-improved land areas. Energy dissipation structures (such as concrete aprons and riprap) have been constructed at culvert openings and discharge points to minimize erosion. In addition, five erosion control dams have been constructed north of the secure area (USAF, 2001b). Chico Creek and Black Squirrel Creek meet all water quality standards (USEPA, 2003a).

Four ephemeral streams flow near the boundary of the base. Three of these streams are along the southern boundary and one stream flows to the east from the base (see Figure 3.1). Flows within these channels are less than the two intermittent streams, but can potentially cause erosion along the stream channel. These

ephemeral streams have cut channels about 5 to 10 feet deep (USAF, 2003c).

Storm water runoff currently infiltrates into the ground or flows overland to swales, ditches and erosion control structures. Drainage off-base is by streams or overland flow.

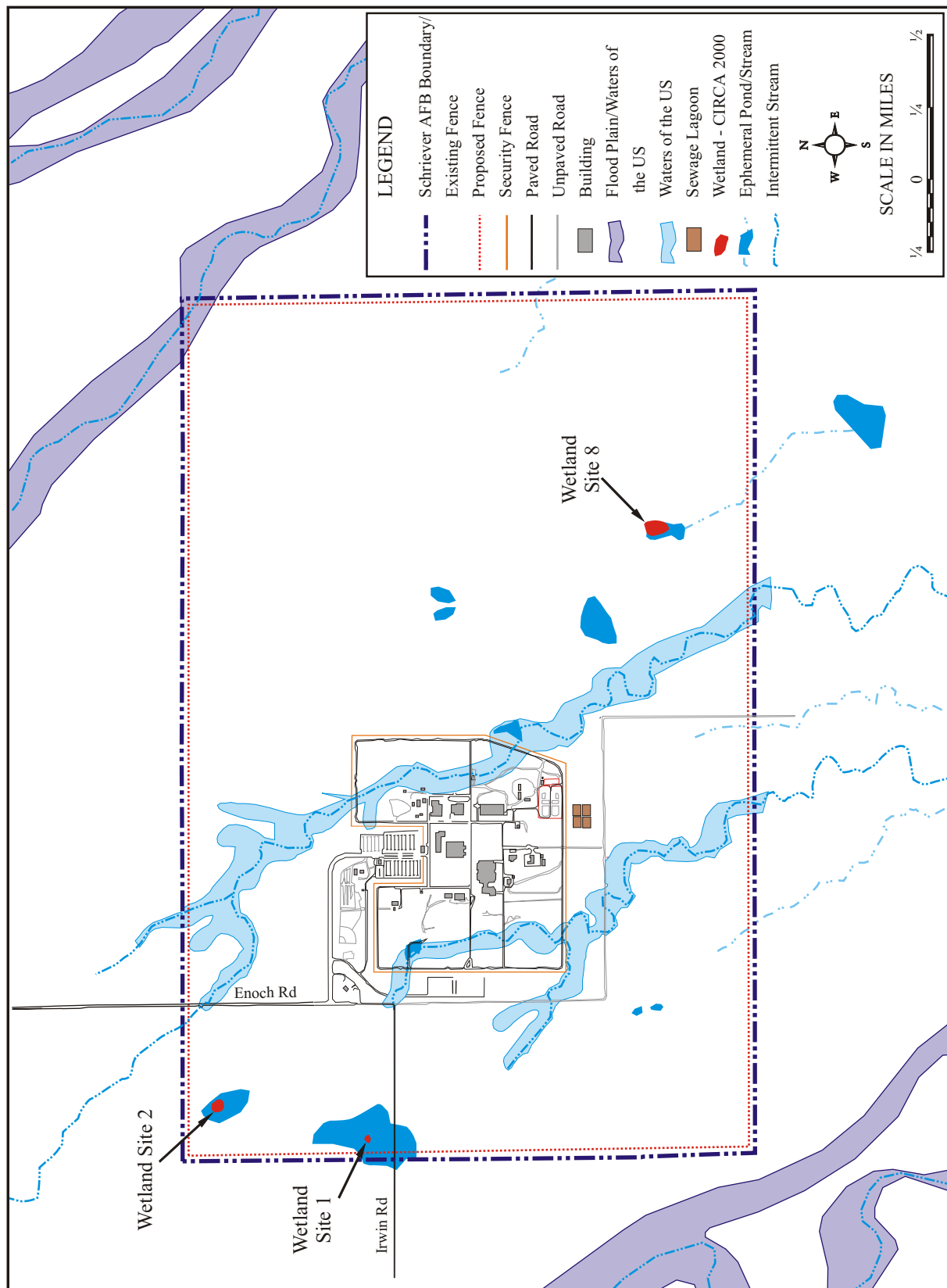
Both of the intermittent streams on Schriever AFB are waters of the United States, subject to the Clean Water Act. Waters of the United States are subject to Section 404 of the Clean Water Act and include both deep water aquatic habitats and special aquatic sites, including wetlands. Under Section 404 of the Clean Water Act, a permit is required for placement of fill material in waters of the United States. Placement of a concrete footer or other structures which do not change the elevation of the stream bed, such as a fence post is not considered to constitute fill (Humphreys, 2003).

Phase II National Pollutant Discharge Elimination System (NPDES) permits are required for soil disturbance between one and five acres. These permits generally require a storm water pollution prevention plan and best management practices specific to the proposed construction activity.

There are 15 small intermittent detention ponds on base. Three of these are classified as wetlands. Wetlands are discussed in Section 3.4.

### **3.3.3 Floodplains**

Schriever AFB includes about 8.5 acres that are situated within the delineated 100-year floodplain for the West Fork of the Black Squirrel Creek, in the northeast corner of the installation (see Figure 3.1). A 100-year flood zone is a land area having a one percent chance of being flooded during a given year. Potential



**Figure 3.1 Water Features in the Project Area**

development in the floodplain is subject to the provisions of Executive Order 11988, *Floodplain Management*, which requires Federal agencies to look at all practical alternatives to avoid impacts to floodplains. Air Force Instruction 32-7064, *Integrated Natural Resources Management*, lists three criteria that must be met for the USAF to construct in a floodplain: evaluate and document the potential effects of such actions through the environmental impact analysis process; consider alternatives to avoid these effects and incompatible development in the floodplain; and design or modify actions in order to minimize potential harm to or within the floodplain.

### 3.4 BIOLOGICAL RESOURCES

Biological resources include the native and introduced plants and animals that make up natural communities. The natural communities are closely linked to the climate and topography of the area. Biological resources discussed below include vegetation, wildlife, threatened or endangered species, wetlands, and noxious weeds.

#### 3.4.1 Vegetation

Historical and present land use on Schriever AFB has altered the original landscape. Visible signs of altered landscape include livestock grazing, fragmentation of continuous habitat by roads, and the construction of base facilities, power lines, and fences.

Schriever AFB lies within the shortgrass prairie of the Great Plains. The prairie landscape is dominated by blue grama (*Bouteloua gracilis*), buffalo grass (*Buchloe dactyloides*), three-awned grass (*Aristida purpurea*), dropseed (*Sporobolus*

*cryptandrus*), and needle and thread grass (*Stipa comata*) (USAF, 2000). Trees are rare on the shortgrass prairie, but a few small, isolated stands are present on Schriever AFB. A stand of mature plains cottonwood (*Populus sargentii*) lies along a draw south of Enoch Road. Box elder (*Acer negundo*) and hawthorn (*Crataegus sp.*) are present in and around three farmsteads, two of which were located in the northwestern corner of the base, while the third was located between the intermittent draw containing the cottonwoods and the Schriever Activity Center (USAF, 2001b). The trees around the farmsteads are suspected to have been planted for windbreak, shade, or landscaping purposes.

Vegetation on the improved areas of Schriever AFB consists of irrigated turf grasses, native grass plantings, and native and ornamental shrub and tree plantings. Sixty acres of improved grounds are irrigated and manual weed control methods and herbicides are used. Other practices on improved grounds include fertilizing, mowing, and aerating. The proposed fenceline lies within non-irrigated, unimproved grounds.

#### 3.4.2 Wildlife

The native fauna of Schriever AFB consists of species typically associated with shortgrass prairie. Pronghorn (*Antilocapra americana*), coyote (*Canis latrans*), and raccoon (*Procyon lotor*) characterize the large mammal component of the shortgrass community. Pocket gophers (*Thomomys sp.*), Ord's kangaroo rat (*Dipodomys ordii*), prairie voles (*Microtus pennsylvanicus*), deer mice (*Peromyscus maniculatus*), black-tailed jackrabbits (*Lepus californicus*), western harvest mouse (*Reithrodontomys*

*megalotis*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), and desert cottontail (*Sylvilagus audubonii*) comprise the small mammal species of the area. A detailed survey was performed by the Nature Conservancy's Colorado Natural Heritage Program (CNHP) in 2000. This survey identified 11 mammalian species on Schriever AFB. None of these species are considered rare, threatened, or endangered by state or Federal agencies.

Migratory birds are protected through International Treaties and the Migratory Bird Treaty Act. Schriever AFB is located within the Central Flyway which extends from Canada to the Gulf of Mexico. A number of common prairie-based birds such as the lark bunting (*Calamospiza melanocorys*), western meadowlark (*Sturnella neglecta*), and horned lark (*Eremophila alpestris*), and several species of raptors such as Swainson's hawk (*Buteo swainsoni*) and American kestrel (*Falco sparverius*) inhabit the shortgrass community around the base (USAF, 2001b). Trees associated with old homesteads or planted on developed portions of Schriever AFB support additional bird species that may not otherwise be found in the area. Species likely to use such trees include American robin (*Turdus migratorius*), house sparrow (*Passer domesticus*), and great horned owl (*Bubo virginianus*) (USAF, 2001b). During the 2000 CNHP inventory, a total of 21 bird species were identified on or near the project area. None of the bird species identified are considered threatened or endangered by state or Federal agencies.

### 3.4.3 Threatened or Endangered Species

The Endangered Species Act requires that any action authorized by a Federal agency shall not jeopardize the continued existence of a threatened or endangered species, or result in the destruction or adverse modification of designated critical habitat of such species. A listed species provided protection under the Endangered Species Act is so designated because of danger of its extinction as a consequence of economic growth and development without adequate concern and conservation.

The 2000 CNHP inventory identified approximately 1,000 individuals of plains ragweed (*Ambrosia linearis*), a globally rare species endemic to eastern Colorado. The plains ragweed community was found in a once natural playa that has been enhanced by a berm to improve its use as a cattle pond (see Section 3.4.4, Wetland Site 8). The area containing plains ragweed or displaying potential habitat is less than 40 acres.

**Plains ragweed (*Ambrosia linearis*)** – The plains ragweed flowers from mid-June to August, and fruits from early August to late September. It is wind pollinated, but asexual reproduction by rhizomes also appears to be important to this species. Plains ragweed is a plant of seasonally moist habitats of sandy soils within the shortgrass prairie region of east-central Colorado between 4,300 and 6,700 feet in elevation. In natural settings, it is frequently encountered in association with intermittent streams and around the margins of intermittent ponds or playas (USAF, 2000).

Base personnel reported sightings of a nesting pair of burrowing owls (*Athene cunicularia*), listed as threatened in

Colorado, in two locations on Schriever AFB. Owls have been sighted on the west-central base boundary just south of the access road and 200 feet east of the base boundary. Owls have also been sighted near the north-central base boundary approximately 200 feet south of the existing fence. Initial owl sightings were reported in April 2002; however, no sightings have occurred in 2003 (Trenchik, 2003). Observations from 2002 note the owls' arrival in April and departure in September; due to the owls' absence through mid summer of 2003, the status of their continued occupancy on Schriever AFB is unknown.

**Burrowing owl (*Athene cunicularia*)** – Burrowing owls occupy dry, open, treeless grasslands where they typically nest in burrows of prairie dogs or ground squirrels. Burrowing owls feed primarily on nocturnal rodents such as voles and kangaroo rats as well as nocturnal insects. In Colorado, burrowing owls are declining in abundance and distribution, and have been extirpated from some areas. On the eastern plains of Colorado, the species remain a locally uncommon to fairly common summer resident and casual winter resident (CNHP, 2001).

Two colonies of black-tailed prairie dogs (*Cynomys ludocivianus*), Federal candidate species, were initially reported by base personnel during the summer of 2001 (Trenchik, 2003). One colony occurs immediately south of the access road and approximately 200 feet east of the western base boundary. The other colony occurs approximately 3,000 feet north and 3,000 feet west of the southeast corner of the base boundary. To date, no official prairie dog survey has been performed and the number of prairie dogs on the base is unknown (Trenchik, 2003).

**Black-tailed prairie dog (*Cynomys ludocivianus*)** – Black-tailed prairie dogs occupy shortgrass and mixed-grass prairie habitats with well-drained, friable soils that permit the construction of complex burrow systems. Black-tailed prairie dogs are diurnal, burrowing, colonially-dwelling, herbivorous rodents that are active aboveground throughout the year (they do not hibernate) (CNHP, 2001).

#### 3.4.4 Wetlands

Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions (USACE, 1987). Wetlands are diverse ecosystems that provide ecological benefits by supporting commercial fisheries, controlling floods, filtering wastes from water, and serving as recreation areas. They also provide habitat for many plant and animal species, including economically valuable waterfowl and one-third of the nation's endangered species. Wetlands are regulated under Section 404 of the CWA and EO 11990 (*Protection of Wetlands*).

A wetland determination for nine potential wetland sites on Schriever AFB was performed by the USACE in June and August of 2000. This wetland determination updated a previous determination performed by the USACE on the same nine sites in 1991. The 2000 determination found a dramatic decrease in sites and acreage that meet wetland criteria as defined by the 1987 *Corps Wetlands Delineation Manual*. Three of the nine sites (Site 1, 2, and 8) currently contain areas that are positive for wetland

determination. They are detailed below and shown in Figure 3.4.

**Wetland Site 1**, located just inside the northwest base boundary, is a 17-acre depression that appears to have been natural in origin and diked to enhance runoff retention (USAF, 2001a). The 1991 wetland determination assigned 7.46 acres in the center of the site as jurisdictional wet meadow or playa lake wetlands, and 0.12 acres located at the northern end of the site as jurisdictional wet meadow or playa lake wetlands. However, the 2000 wetland determination recognizes only a 900 square foot “remnant” of the former center pond-like area as jurisdictional wet meadow or playa lake wetlands.

**Wetland Site 2**, located approximately 1,700 feet north of the access road and just inside the western base boundary, is a 7-acre depression surrounded by shortgrass prairie (USAF, 2001a). The 1991 wetland determination assigned 3.90 acres in the center of the depression as jurisdictional playa lake wetlands. However, the 2000 wetland determination recognizes slightly less than 1 acre at the center of the depression as jurisdictional playa lake wetlands. The apparent decrease in area is thought to be due to a decrease in effective precipitation (USAF, 2001a).

**Wetland Site 8**, located approximately 1,700 feet north of the southern base boundary and 4,500 feet west of the eastern base boundary, is a 1.5-acre depression created by damming a non-jurisdictional drainage way (USAF, 2001a). The 2000 wetland determination maintains the 0.08 acres non-jurisdictional wetland determination defined in the 1991 determination. It was noted that hydrophytic vegetation has

been damaged due to trampling by cattle (USAF, 2001a).

### 3.4.5 Noxious Weeds

The Colorado Department of Agriculture, Division of Plant Industry develops and coordinates integrated weed management programs in the state. “Noxious weed” is defined by the Colorado Noxious Weed Act, § 35-5.5-103, C.R.S. (2000) as an alien plant or parts of an alien plant that have been designated by rule as being noxious or has been declared a noxious weed by a local advisory board, and meets one or more of the following criteria;

- (a) Aggressively invades or is detrimental to economic crops or native plant communities;
- (b) Is poisonous to livestock;
- (c) Is a carrier of detrimental insects, diseases, or parasites;
- (d) The direct or indirect effect of the presence of this plant is detrimental to the environmentally sound management of natural or agricultural ecosystems.

The County Forestry and Noxious Weeds Department regulates noxious weeds and pests on public and private lands within its jurisdiction. The Air Force actively manages noxious weeds on Schriever AFB pursuant to AFI 32-1053, *Pest Management*. Schriever AFB implements mowing or spot herbicide treatment, applied by a commercial contractor under the management of base Civil Engineering, to control noxious weeds.

According to an invasive plant species survey performed by the USACE in 2001, eight species of noxious weeds listed by the *Colorado Noxious Weed Act* were identified on base property. Table



Table 3.4-1 Invasive Species Found on Schriever AFB (non-cantonment lands)			
Common Name	Scientific Name	Acreage	Category*
Diffuse knapweed	<i>Centaurea diffusa</i>	3.0	A
Canada thistle	<i>Cirsium arvense</i>	1.9	A
Field bindweed	<i>Convolvulus arvensis</i>	25.4	A
Yellow sweetclover	<i>Melilotus officinalis</i>	2,023.7	B
Russian thistle	<i>Salsola iberica</i>	2,382.7	B
Goatsbeard	<i>Tragopogon dubius</i>	59.0	B
Tumble mustard	<i>Sisymbrium altissimum</i>	34.9	B
Kochia	<i>Kochia scorpia</i>	38.4	C
*A – Colorado top 10 weed species. B – Not known as widespread in state, but has economic impact. C – Other listed state species Source: USACE, 2001			

3.4-1 lists these eight species and their associated acreages.

Of the eight listed invasive plant species detected during the 2001 survey, two are found on the El Paso County list of noxious weeds. These were diffuse knapweed (*Centaurea diffusa*) and Canada thistle (*Cirsium arvense*). The survey reports that diffuse knapweed was present in a 3.0-acre patch along the east side of Enoch Road, and that Canada thistle populations exist in several patches totaling 1.9 acres in rangeland bordering the west side of Enoch Road. Base personnel have noticed an increase of noxious weeds since the 2001 survey. The increase of noxious weeds may be attributed to the overgrazing of resident cattle herds on the installation.

### 3.5 ENVIRONMENTAL JUSTICE

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was signed by the President on February 11, 1994. This EO requires that each Federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on

minority populations and low-income populations. In order to evaluate these potential effects, demographic data on minority populations and low-income populations are provided in this section.

The terms “low-income” and “minority” are defined according to guidance published by the Air Force Center for Environmental Excellence (AFCEE). Under this guidance, “low-income” is defined as persons below the poverty level. The poverty threshold, which is a function of family size and is adjusted over time to account for inflation, was designated by the Federal government as \$17,524 for a family of one adult and three children in 2000. “Minority” means persons designated in census data as Black (African-American); American Indian, Eskimo, or Aleut (Native American); Asian or Pacific Islander (now two separate designations in the 2000 Census); Other; or of Hispanic origin (AFCEE, 1997). The 1997 AFCEE Guidance did not address the new census category, “Two or more Races;” for this analysis, that category is also considered as a minority. According to the United States Bureau of Census (USBC) definition (USBC, 2001a), the Hispanic origin designation is separate from the ethnic (racial) designation, as

“people who identify their origin as Spanish, Hispanic, or Latino may be of any race.” Within this document, to avoid confusion and eliminate double-counting, the Hispanic population is differentiated from ethnic (racial) minority populations.

Environmental Justice also takes into consideration EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, which was signed by the President on April 21, 1997. This EO requires that each Federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on children, who are more at risk because of developing body systems, comparatively higher consumption-to-weight ratios, behaviors that may expose them to more risks and hazards than adults, and less ability than adults to protect themselves from harm.

This section describes the minority and low-income characteristics of El Paso County and an area near Schriever AFB which would potentially be affected by the Proposed Action. The descriptions are based on data from the 2000 *Census of Population and Housing*. Table 3.5-1 summarizes the proportions of ethnic, Hispanic, and low-income populations in El Paso County. The 2000 Census found that the population of El Paso County was 81 percent White. Notable other categories include Black or African-American (6.5 percent), and Asian (2.5 percent), while Other and Two or More Races accounted for 8.6 percent of the total. Hispanics comprise more than 11 percent of the El Paso County population.

Colorado proportions are somewhat similar, but with smaller proportions of

Blacks and Asians, and 10 percent of the state’s population identifying themselves as Other or Two or More Races. The State’s Hispanic population accounts for more than 17 percent of the total. In contrast, the U.S. population is approximately 25 percent minority, with Hispanics (12.5 percent) as the largest minority group, and Blacks representing 12.3 percent of total population. Less than 10 percent of the El Paso County population was below the poverty level, while about 10 percent of the state’s population and 13 percent of the U.S. population was in this category. The 1997 per capita income for El Paso County was \$23,493, which represents nearly 93 percent of the U.S. per capita income and 88 percent of Colorado’s per capita income (USBC, 2000).

The Census shows within the vicinity of Schriever AFB, a higher percentage of the population is white (92.9 percent) compared to El Paso County (81.2 percent) and Colorado (82.8 percent) and a lower percentage below poverty level (5.4 percent) compared to El Paso County (8 percent) and Colorado (9.3 percent). There are 407 off-base residents in census blocks within one and a half miles of the project area. Some of the census blocks contiguous to Schriever AFB extend over 3.5 miles from the boundary of the base. This population includes 378 whites, five blacks, four American Indian and/or Alaska Native, one Asian, identified nine as “other race”, and 10 people of two or more races. There are 31 people identified as Hispanic or Latino origin, and there are 126 children within this area (USBC, 2002; USBC, 2001b).

### **3.6 SOLID WASTE**

Solid wastes include all waste materials that are neither hazardous nor toxic, and

which are normally disposed of by landfilling or incineration, or are recycled or recovered. In accordance with AFI 32-7042, *Solid and Hazardous Waste Compliance* and AFI 32-7080, *Pollution Prevention Program*, Schriever AFB strives to recycle as much of their solid waste stream as possible. The management of solid (non-hazardous) waste on Schriever AFB includes the collection and disposal of solid wastes and

recyclable material by contract. Recyclable items include cans, newspapers, plastic, office paper, and cardboard. There are no active landfills on base; solid waste is taken by a contractor to the Colorado Springs landfill (USAF, 1999b). The Colorado Springs Landfill and Recycling Center has adequate capacity to handle waste through 2007. Operations will then shift to the expansion site off Blaney Road.

<b>Table 3.5.1</b> <b>Census 2000 Characteristics:</b> <b>Population Segment as a Percentage of the Total Population, Proposed Site</b>			
	<b>Census blocks in affected area<sup>1</sup></b>	<b>El Paso County</b>	<b>CO</b>
White (a)	92.9%	81.2%	82.8%
Black or African American (a)	1.2%	6.5%	3.8%
American Indian and Alaska Native (a)	1.0%	0.9%	1.0%
Asian (a)	0.2%	2.5%	2.2%
Native Hawaiian and Other Pacific Islander (a)	0.0%	0.2%	0.1%
Some other race (a)	2.2%	4.7%	7.2%
Two or more races	2.5%	3.9%	2.8%
Hispanic Origin (can be any race)	7.6%	11.3%	17.1%
Children (age 17 or less)	31.0%	27.6%	25.6%
Below poverty level <sup>2</sup>	5.4%	8.0%	9.3%
(a) Includes persons reporting only one race. Population by race is from Census 2000 Summary File 1.			
<sup>1</sup> Census blocks off-base within 2 miles of the proposed site.			
<sup>2</sup> Values for the percent of persons below poverty level are from Census 2000 Summary File 3.			
Sources: USBC, 2002; USBC, 2001b.			

# **CHAPTER 4**

## **ENVIRONMENTAL CONSEQUENCES**



## **4. ENVIRONMENTAL CONSEQUENCES**

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This chapter discusses the potential for significant impacts to the human environment as a result of implementing the Proposed Action or the No Action Alternative. As defined in 40 CFR Section 1508.14, the human environment is interpreted to include natural and physical resources, and the relationship of people with those resources. Accordingly, this analysis has focused on identifying types of impacts and estimating their potential significance. This chapter discusses the effects that the Proposed Action or No Action Alternative could generate on the environmental resource areas described in Chapter 3.

The concept of “significance” used in this assessment includes consideration of both the context and the intensity or severity of the impact, as defined by 40 CFR 1508.27. Severity of an impact could be based on the magnitude of change, the likelihood of change, the potential for violation of laws or regulations, the context of the impact (both spatial and temporal), and the resilience of the resource. Significant impacts are effects that are most substantial and should receive the greatest attention in decision making. Impacts that are not significant include those that result in little or no effect to the existing environment and cannot be easily detected. If a resource would not be affected by a proposed activity, a finding of no impact was declared. If a resource would be improved by a proposed activity, a beneficial impact was noted.

This chapter is organized by resource element in the same order as introduced in Chapter 3. This chapter

provides a discussion of the analysis methods and the potential impacts of the Proposed Action and No Action Alternative. Best management practices are included in the discussion as well as mitigation measures. The chapter concludes with an evaluation of the relationships between short-term uses of the environment and long-term productivity, cumulative impacts, and irreversible and irretrievable commitments of resources.

### **4.1 AIR RESOURCES**

The Proposed Action would have short-term, but not significant, impacts on air quality generated by installation of the security fence around the buffer zone. The Proposed Action conforms to the SIP and is exempt from further conformity review (this is discussed in more detail below). Schriever AFB would remain below thresholds for a major source and PSD review requirements. The base would also continue to be a minor source of HAPs. Air quality would not change under the No Action Alternative.

#### **4.1.1 Analysis Methods**

The analysis was based on a review of existing air quality in the region, information on Schriever AFB air emission sources, projections of emissions from the proposed activities, a review of the Federal and Colorado regulations for air quality, and the use of air emission factors from the USEPA or similar sources.

#### **4.1.2 Potential Impacts of the Proposed Action**

Construction of the proposed security fence would generate emissions of

criteria pollutants from limited areas of grading, construction equipment, trucks driving on paved and unpaved roads, and worker vehicles.

Approximately 2 acres of soil would be disturbed during construction. An El Paso County Dust Control Permit would be needed since the project would disturb more than one acre. A Colorado APEN would not be needed since ground disturbance would be less than 25 acres and less than six months in duration. The majority of emissions would be generated by operation of construction equipment. Estimated emissions from construction are shown in Table 4.1-1. Best management practices (such as application of water or chemical stabilizers to disturbed areas as needed, and revegetating sites as soon as possible) would be implemented to control fugitive dust (a source of PM<sub>10</sub>).

Estimated emissions would not exceed the NAAQS or CAAQS due to the amount of criteria pollutants generated (see Table 4.1-1), the relatively large area in which the emissions would occur, and the dispersive meteorological conditions (winds average between 8 and 12 miles per hour) in which the emissions would be generated. Therefore, the focus of the analysis centers on conformity with the SIP for the CO maintenance area.

Schriever AFB, as part of the Colorado Springs Metropolitan Area, is located within a maintenance area for CO. Emissions would be regionally significant if they exceeded 10 percent of the inventory for any affected pollutant (in this case, CO). The SIP budget for CO in the Colorado Springs Metropolitan Area is 270 tons per day, or 98,550 tons per year. Emissions

from the Proposed Action do not comprise 10 percent of the daily inventory and are not regionally significant.

Conformity thresholds, as defined in 40 CFR 51, Subpart W, are used to determine conformity with a SIP. The threshold for CO is 100 tons per year (shown in Table 4.1-1). An exceedance of this threshold would result in non-conformity with the SIP. Estimated emissions from the Proposed Action are less than this threshold, would conform to the SIP, and are not significant. The Proposed Action is not regionally significant and the total direct and indirect emissions would be below the 100 tons per year de minimus threshold for CO. Therefore, this project is exempt from further conformity analysis pursuant to 40 CFR 93.153.

Construction equipment would generate small amounts of HAPs. These emissions would not be significant.

Detailed calculations are shown in Appendix B. Because the activities would not exceed or contribute to an exceedance of air quality standards and conform with the SIP, the impacts would not be significant. No other air pollutants of note would be generated during the Proposed Action.

The Proposed Action would have unavoidable short-term and long-term impacts on air quality. Exhaust emissions from construction equipment would be generated, and fugitive dust would be generated during construction activities. These emissions would not be significant, given the short duration of time for the activities. Other

<p align="center"><b>Table 4.1-1</b>  <b>Air Pollutant Generation from Construction</b>  <b>Proposed Action (tons per year)</b></p>					
	<b>VOC</b>	<b>PM<sub>10</sub></b>	<b>CO</b>	<b>SO<sub>x</sub></b>	<b>NO<sub>x</sub></b>
Construction emissions	0.39	5.97	4.09	0.22	3.42
Regionally significant			9,855.00		
Conformity thresholds			100.00		
<p>Source: Calculated with emission factors from AP-42 (USEPA, 1995-2003) and USEPA, 2002; USAF, 2002.  Regionally significance and conformity thresholds per 40 CFR 51, Subpart W</p>					

emissions from construction would be unavoidable, but not significant. No long-term emissions would be generated.

#### **4.1.3 Potential Impacts of the No Action Alternative**

Emissions of criteria pollutants and HAPs would remain the same under the No Action Alternative. Impacts from the No Action Alternative would not be significant.

#### **4.1.4 Mitigation Measures**

Mitigation measures can be used to reduce air emissions, but because the potential emissions are not significant, no mitigation is necessary. Best management practices (further discussed in Section 4.2.2) would be implemented to control emissions of fugitive dust during construction.

### **4.2 GEOLOGICAL RESOURCES**

Geological resources are limited, non-renewable earth resources whose characteristics can easily be degraded by physical disturbances. Impacts to geological resources would not occur because the soil depths exceed the drilling depth along the entire perimeter of the fence boundary. Topography and soils would be

directly impacted from boring, grading, and compaction by equipment during construction. About 2 acres would be disturbed by the Proposed Action; impacts would not be significant. Geological resources would not be impacted under the No Action Alternative.

#### **4.2.1 Analysis Methods**

The geological resources within the proposed project area were studied to determine the potential impacts from implementing the Proposed Action and No Action Alternative. Geological studies, the soil survey for the El Paso County area, previous EAs, topographic contours from Schriever AFB, and a USGS topographical map were reviewed to characterize the existing environment. Construction activities that could influence geological resources were evaluated to predict the type and magnitude of potential impacts. For example, soils would be disturbed during construction activities, especially during soil borings for the proposed postholes and limited grading activities for installation of the fence. The predicted post-construction environment was compared to the existing environment and the change was evaluated to determine if significant changes in any existing conditions would occur.



#### **4.2.2 Potential Impacts of the Proposed Action**

The underlying geological layers would not be impacted due to the depth of the soil borings. All soils are greater than 5 feet in depth and the soil boreholes would extend to a depth of about 4 feet. As discussed in Section 3.2, there are no major faults in the project area. The area is located in Zone 1 for potential earthquake damage with slight damage anticipated from any seismic event. Impacts from seismicity would not be significant.

The proposed security fence would be installed in areas ranging from about 6,090 to 6,370 feet in elevation. The slope ranges from about 1 to 9 percent in the majority of this area. Areas near stream channels have slopes up to about 55 percent. About 2 acres of Ascalon, Blakeland, Blendon, Bresser, Ellicott, Sampson, and Truckton soils would be disturbed by boring, minor grading, and compaction from equipment during installation of the proposed fence. The Keith soils would not be impacted by the Proposed Action. Construction of the fence would require about 5,280 holes drilled to a depth of 42 inches at 10 foot intervals. Each of these holes would have a diameter of 12 inches, excluding the corner posts which would have a diameter of 18 inches. The soil removed from the holes would be used for grading around the installed posts and along the length of the fence if necessary. Where the fence would cross stream beds, one of two options would be implemented. The first option is to construct the fence following the contours of the ground. The second option is to construct a hanging wall up to four feet high with

drainage holes or culverts (see Figure 2.2). The hanging wall would be constructed on concrete footers, and the fence would be constructed on top of the wall.

The affected areas would be regraded after this disturbance. This action would not significantly affect the topography or drainage in the area.

Disturbance of these soils during construction activities would expose the soil to potential erosion by wind and water. If the soil was left disturbed for extended periods of time, erosion could be substantial, as most of these soils have a moderate to high risk of erosion by wind and water. Due to the limited area impacted and the length of construction, impacts to soils would not be significant. Best management practices (such as daily watering as needed, chemical stabilization, maintaining existing vegetation as much as possible, and revegetating sites as soon as possible) would be implemented to reduce the risk of erosion. Impacts to hydrogeology and groundwater are discussed in Section 4.3.

Long-term soil productivity in affected areas would not be significantly impacted. Projected erosion rates (about 0.90 tons per acre per year) are well below the soil-loss tolerance factor of 5 tons per acre per year for these soils. Topsoil would be restored to disturbed areas and vegetation would be reestablished, maintaining soil productivity.

#### **4.2.3 Potential Impacts of the No Action Alternative**

The proposed new security fence would not be constructed under the No

Action Alternative; therefore, geological resources would not be impacted.

#### **4.2.4 Mitigation Measures**

No significant impacts would result from implementing the Proposed Action; therefore, no mitigations would be required.

### **4.3 WATER RESOURCES**

Boring holes and installing the proposed security fence would not disturb the unconfined surficial aquifer. Impacts to groundwater would not be significant. Impacts to surface water from erosion or storm water runoff would not be significant. A Phase II NPDES permit for construction would be required. There would not be any long-term impacts to water resources. If the No Action Alternative were selected, there would be no change in water resources.

#### **4.3.1 Analysis Methods**

To establish the potential impacts of the Proposed Action and the No Action Alternative, documents on the hydrology and hydrogeology of the area were reviewed. Maps showing topography, watersheds, and base drainage were examined. The review focused on the proximity of the proposed activities to surface waters, hydrogeology in the project area, and water quality in the local area, and evaluated the effects of the actions with regard to those factors. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps were reviewed to identify floodplains in the project area.

#### **4.3.2 Potential Impacts of the Proposed Action**

Borings for placing fence posts for the proposed security fence would reach a depth of about 4 feet and would not impact groundwater. A spill or leak of fuel or lubricants is not likely during excavation in this area, but if one occurs, it would be cleaned up immediately, in accordance with the Schriever AFB Spill Response Plan, to prevent contamination of the aquifer. Given the small amount of oil and fluids used by construction equipment, impacts to the water quality of aquifers underlying Schriever AFB would not be significant. Wells obtaining stock and domestic water in the vicinity of the base would not be impacted by the Proposed Action.

Installation of the proposed security fence would increase impermeable surfaces by about half an acre, slightly decreasing the recharge area of the unconfined surficial aquifer and slightly increasing storm water runoff. The site for the Proposed Action also overlies the perennially saturated Laramie-Fox Hills and Arapahoe Aquifers, and a small area of the Denver Aquifer. This would negligibly impact recharge of these aquifers. Impacts to the aquifer would not be significant.

Disturbed areas would be vulnerable to wind and water erosion during the process of boring fencepost holes and minor grading of the site. Particulate matter would be transported and deposited by wind in the local area. Deposition of particulate matter and siltation of streams would not be significant due to the dispersive wind conditions and small amounts of

particulate matter that would be generated by the Proposed Action (see Section 4.1). Water erosion could occur on steeper slopes near stream beds (see Figure 3.3), but would not be significant due to the limited areas potentially eroded and the duration of construction. Native vegetation would be reestablished as soon as practical after construction of the fence.

The proposed fence would cross two intermittent streams which have been defined as waters of the United States (see Section 3.3). A permit from the U.S. Army Corps of Engineers is required for any action constituting a fill or dredging of a stream bed which has been defined as waters of the United States. Installing fence posts and chain link fence fabric is not considered fill and a permit would not be required (Humphreys, 2003).

Where the fence would cross stream beds, one of two options would be implemented. The first option is to construct the fence following the contours of the ground. The second option is to construct a hanging wall up to four feet high (see Figure 2.2).

Constructing the fence to follow the ground would allow stream flow through the fence with little impedance. In the event of a heavy storm, the stream flow could deposit debris on and near the fence, causing a slightly reduced flow of drainage and minor siltation near the fence. Impacts would not be significant. As a best management practice, the fence would be periodically inspected to insure the integrity of the fence and to prevent a buildup of debris or siltation near the fence.

At stream crossings where a hanging wall would be constructed, the wall would be constructed on concrete footers, and the fence would be constructed on top of the wall. The walls would be constructed of concrete, on concrete footers, with several drainage holes to allow stream flow to pass through. The size and position of the drainage holes would determine the potential impedance to stream flow during and after storm events. Depending on the design of the hanging wall at any particular drainage, stream flow could be impeded by up to 50 percent during higher flows, potentially causing temporary flooding in the vicinity of the walls and a potential increase in erosion around the edges of the structure. Impacts would not be significant due to the limited area potentially impacted and the frequency of heavy storm events. As a best management practice, the hanging wall and fence would be periodically inspected to insure the integrity of the wall and fence and to prevent a buildup of debris or siltation near drainage areas. Measures to control erosion are discussed in Section 4.2.

Storm water runoff would negligibly increase around the areas of concrete footings for fenceposts. Runoff would be localized and would not impact storm water drainage in the area. There would not be any increase in potential storm water contamination from construction of the fence (the fence would not be located next to any parking lots or other areas of potentially contaminated runoff). Impacts from storm water runoff would not be significant. A Phase II NPDES permit would be required for construction activities. Siltation of streams could slightly increase, but

impacts to water quality would not be significant.

Portions of the proposed security fence or hanging walls within and close to drainages could potentially be damaged during or after heavy storm event. This would cause increased erosion in the vicinity of these structures, but the extent of the erosion would be limited and would not result in significant impacts to water resources.

As discussed in Section 3.3, about 8.5 acres in the northeast corner of the base are in the 100-year floodplain of the West Fork of the Black Squirrel Creek. About 1,800 feet of the boundary line of Schriever AFB is within floodplain. Because the fence would be constructed within the floodplain, a Finding of No Practicable Alternative (FONPA) has been prepared in accordance with Executive Order 11988 and Air Force Instruction 32-7064 (see Section 3.3). Constructing the proposed security fence in the floodplain would add about 140 square feet (less than 0.01 acre) of impermeable surface to the floodplain. This would negligibly affect the hydrology of the affected floodplain area. Minor grading of the pathway for the fence (in order to put a tension bar at the bottom of the chain link fabric and for placing fenceposts) would only negligibly impact the elevation of affected areas (there would not be any net increase in elevation). The potential impacts of flooding in this area would not substantially change (the elevation of flood waters, or the impacts of floods on erosion rates or siltation would not substantially change from current conditions). Portions of the fence could potentially be damaged from flooding, but this would not result

in any significant environmental impacts. Coordination with the USACE, Southern Colorado Regulatory Office (Humphreys, 2003) determined that construction of the proposed fence would not include any discharges of dredged or fill material into waters of the United States (see Letter #4 of Appendix A). Constructing part of the proposed security fence within the floodplain would not result in any significant impacts to water resources.

#### **4.3.3 Potential Impacts of the No Action Alternative**

Under the No Action Alternative, there would be no impact to groundwater, surface water, or floodplains.

#### **4.3.4 Mitigation Measures**

No significant impacts were identified from the Proposed Action or No Action Alternative, and mitigations would not be required.

### **4.4 BIOLOGICAL RESOURCES**

Impacts to biological resources would result primarily from small-scale excavation activities associated with the construction of the security fence. The effects of fence construction would minimally impact vegetation and wildlife in the project area. No critical habitat, threatened or endangered species, or wetlands would be affected by the Proposed Action, and (assuming best management practices are followed) no increases in noxious weed populations are expected. Therefore, impacts to biological resources would not be significant. Under the No Action Alternative, there would be no change

in the biological environment of the project area.

#### **4.4.1 Analysis Methods**

The assessment of potential impacts to biological resources focused on the proposed location of the perimeter security fence. The existing habitat was evaluated in areas with planned project activities. The *Integrated Natural Resources Management Plan for Schriever AFB* (USAF, 2001b), the *Natural Heritage Inventory of Schriever AFB* (USAF, 2000), the *Wetlands Re-examination of Schriever AFB* (USAF, 2001a), the *General Plan for Schriever AFB* (1999b), the *Survey of Critical Biological Resources in El Paso County* (CNHP, 2001), and the *Invasive Plant Species Survey and Management Guidelines for Schriever AFB* (USACE, 2001) were reviewed, along with past NEPA documents, to provide data on existing biological resources in the project area.

#### **4.4.2 Potential Impacts of the Proposed Action**

The loss of minimal vegetation and temporary displacement of wildlife during construction activities would be an unavoidable impact, but not significant. Best management practices and control measures would be implemented to ensure that impacts to biological resources are kept at a minimum. As stated in the Statement of Work for the fence installation, upon fence completion, disturbed areas would be re-established with native vegetation (USAF, 2003a).

Concrete would be substituted for small, evenly distributed areas of soil (a 12-inch diameter circle every 10-feet), thus decreasing the overall area

of potential vegetative habitat on the base. However, the minimal amounts of soil displaced and the non-critical nature of shortgrass prairie in this region negates any significant impacts to vegetation. The Proposed Action would have no significant impacts on the shortgrass prairie found throughout the project area.

Significant impacts to wildlife from the construction of the fence are not expected to occur, as habitat alteration would be minor. Once the perimeter fence is completed, short-term impacts to transient mammals would occur. Many medium to large mammals such as pronghorn and coyote may find the fence an initial barrier that prevents them from foraging or moving through the area. Upon completion of fence construction, base personnel would monitor the property to ensure that no large mammals (pronghorn, coyote) were contained within the fence. If large mammals were found to be trapped inside the installation boundary, the Colorado Department of Wildlife would be contacted and arrangements would be made to move them outside of the fence. Excluding wildlife from accessing the installation would not result in a significant impact since there are no substantial water sources on base property. Also, pronghorn would not be impacted by displacement from food sources as healthier shortgrass prairie communities exist outside of the overgrazed prairie communities on Schriever AFB. Small mammals such as Pocket gophers, Ord's kangaroo rat, prairie voles, deer mice, black-tailed jackrabbits, western harvest mouse, thirteen-lined ground squirrel, and desert cottontail would not be impacted by the Proposed Action as they would

have adequate forage requirements within the fenced area, or be able to manipulate an exit from the fenced area without harm.

The three species of special concern (plains ragweed, burrowing owl, and black-tailed prairie dog) inhabit specialized communities far enough from the proposed fenceline to not be impacted by the minor excavation associated with its construction. No significant impacts to species of special concern would occur under the Proposed Action.

The three wetland areas are not in close proximity to the project area, and (assuming best management practices are followed) no siltation is expected to affect these areas. Although Wetland Site 8 is the furthest wetland from the project area, special attention should be paid to this site due to the globally rare plains ragweed that inhabits this wetland.

Best management practices outlined in the Statement of Work for the fence installation, call for the immediate re-establishment of native vegetation following the conclusion of construction activities (USAF, 2003a). Following these best management practices would ensure noxious weeds establishment is avoided in the areas disturbed by construction activities. Following project completion periodic monitoring would be performed to ensure that the planted, native vegetation inhabits the disturbed areas and ruderal species (plants that colonize disturbed areas, quickly dominate, and push out desirable species) do not become established.

#### **4.4.3 Potential Impacts of the No Action Alternative**

Under the No Action Alternative, the perimeter security fence would not be constructed. Subsequently, current conditions in the project area would not change and no impacts to biological resources would occur.

#### **4.4.4 Mitigation Measures**

Taking into account the normal application of best management practices during construction of the security fence (e.g., measures to control soil erosion and replacement of vegetation as soon as possible), the impacts to biological resources would not be significant. No mitigation measures are necessary or suggested.

### **4.5 ENVIRONMENTAL JUSTICE**

Activities related to the Proposed Action were evaluated to determine if they would disproportionately impact a minority population or low-income population, or children. None of the impacts from construction of the proposed security fence would be significant, and they would not disproportionately impact a minority population or low-income population, or children. No significant environmental justice impacts were identified from the Proposed Action.

#### **4.5.1 Analysis Methods**

Measures used for impact analysis include demographic and income data obtained from the U.S. Bureau of Census (2000); these data were used to locate minority populations and low-income populations with the project area. The affected area is defined as populated areas which could

potentially be impacted by activities from the Proposed Action (emissions from air pollutants or contaminants reaching ground water or surface water resources). These impacts would generally occur within about one mile of the Proposed Action. Census blocks contiguous to and within one mile of the base were identified. Some of the census blocks in the vicinity of Schriever AFB extend out over 3.5 miles from the base and include populations which would not be affected by potential impacts resulting from the Proposed Action. Because these populations are not further subdivided by the US Census Bureau, the entire population in these census blocks are included in the analysis. Because of this, the population identified by the analysis is likely greater than the actual population impacted by the Proposed Action.

#### **4.5.2 Potential Impacts of the Proposed Action**

The Proposed Action would result in increased emissions of criteria pollutants, noise generated by construction equipment, and the use of fuels. None of these impacts would be significant. The Proposed Action would take place in a sparsely populated area. According to the 2000 U.S. Census, there are 407 off-base residents within about one and a half miles of the project. The percentages of minorities and population below the poverty level within this area are lower than the average for El Paso County and the State of Colorado. Therefore, no disproportionate impacts to minority populations or low-income populations would occur. The proportion of children is slightly higher than the County average. However, no

significant impacts from the Proposed Action have been identified and impacts to children would not be significant.

#### **4.5.3 Potential Impacts of the No Action Alternative**

Under the No Action Alternative, no impacts to the affected environment were identified. There would be no change in current conditions affecting low-income populations, minority populations, and children.

#### **4.5.4 Mitigation Measures**

No significant impacts have been identified; therefore, no mitigation measures are required.

### **4.6 SOLID WASTE**

No significant impacts would occur from disposing of or recycling solid waste generated by construction of the proposed security fence and removal of the existing barbed-wire fence. No changes to the solid waste program would occur from the No Action Alternative.

#### **4.6.1 Analysis Methods**

The existing solid waste program at Schriever AFB, and capacities of landfills in the vicinity of the base were assessed to determine the potential significance of disposing of or recycled materials generated by the Proposed Action.

#### **4.6.2 Potential Impacts of the Proposed Action**

The Proposed Action would generate a temporary increase in debris, most of which would be recyclable. Approximately 158,400 feet of barbed wire and 5,300 T-posts from the

existing fence (to be removed as part of the Proposed Action) would be recycled to the extent possible (in accordance with AFI 32-7080, *Pollution Prevention Program*, and AFI 32-7042, *Solid and Hazardous Waste Compliance*), with any remaining amounts disposed of in an area landfill. Small amounts of solid waste would also be generated by construction of the proposed fence. All solid waste generated by the Proposed Action would be handled by the contractor installing the fence (USAF, 2003a). These quantities would not affect current disposal agreements or have a substantial effect on landfill capacities. The Proposed Action would not have a significant impact on the solid waste management program.

#### **4.6.3 Potential Impacts of the No Action Alternative**

Under the No Action Alternative, the proposed security fence would not be constructed and the existing barbed-wire fence would remain in place. The amount of solid waste generated at the base would not change.

#### **4.6.4 Mitigation Measures**

No significant impacts have been identified; therefore, no mitigation measures are required.

#### **4.7 COMPATIBILITY OF THE PROPOSED ACTION WITH OBJECTIVES OF FEDERAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS**

The Proposed Action would be compatible with the existing Federal, Colorado, and El Paso County land use plans, policies, and controls. The

action is also compatible with DoD goals to combat terrorism.

#### **4.8 RELATIONSHIPS BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY**

The definitions of short-term and long-term are based on the scope of the Proposed Action. Short-term use of the environment, as it relates to the Proposed Action, would encompass the construction period. Long-term productivity would occur after the construction period has ended. During construction soil would be excavated and there would be associated dust emissions. Excavation and construction would not have a significant environmental effect and impacts would be minimized through best management practices. The fence would have a long useful life and therefore, high long-term productivity.

#### **4.9 CUMULATIVE IMPACTS**

Cumulative impacts are those changes to the physical and biological environments that would result from the Proposed Action in combination with reasonably foreseeable future actions. Significant cumulative impacts could result from impacts that are not significant individually, but when considered together, are collectively significant.

Cumulative impacts associated with the Proposed Action include the incremental decrease in available habitat that transient mammals could forage and move through. The use of construction-related vehicles and their short-term impacts on air quality is



unavoidable. The short-term increases in air emissions and the impacts predicted for other resource areas would not be significant when considered cumulatively with other previous, ongoing, or reasonably foreseeable activities at Schriever AFB. While other construction is taking place on the installation, most of these projects would take place during different timeframes and they would be located in different locations on the installation.

Any future Federal actions that may have potentially significant cumulative impacts to the environment would be assessed in separate NEPA documents.

#### **4.10 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

The irreversible and irretrievable commitment of resources would most likely involve the commitment of concrete, energy, fuel, labor, and fencing materials. The irretrievable resources to be committed are typical for the scale of the proposed project. Implementation of best construction management practices, standard equipment maintenance schedules, and use of energy conservation and recycling measures during the fence construction would minimize the use of irretrievable resources. None of these materials are considered rare and the long-term commitment of these resources would not have a substantial effect on their future availability.

# **CHAPTER 5**

## **REGULATORY REVIEW AND PERMIT REQUIREMENTS**



## 5. REGULATORY REVIEW AND PERMIT REQUIREMENTS

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This section lists a brief summary of Federal and state laws and regulations that may be applicable to the Proposed Action or Alternatives and addresses regulatory review and permitting requirements.

### 5.1 Federal and State Laws and Regulations

#### Environmental Policy

The *National Environmental Policy Act* of 1969 [42 United States Code (U.S.C.) Sec. 4321, *et seq.*] establishes national policy, sets goals, and promotes efforts, which will prevent or eliminate damage to the environment and biosphere. The NEPA process is intended to help public officials make decisions that are based on an understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. The process is also intended to provide information regarding the analyses of proposed major federal actions that may significantly affect the environment to the public. The President's CEQ regulations [40 CFR 1500-1508] implement the procedural provisions of NEPA.

32 CFR 989, *Environmental Impact Analysis Process (EIAP)*, implements the Air Force EIAP and provides procedures for environmental impact analysis.

Executive Order (EO) 11514, *Protection and Enhancement of Environmental Quality*, as amended by EO 11991, sets the policy for directing the Federal Government in providing leadership in protecting and enhancing the quality of the nation's environment.

#### Department of Defense

DoD installations are required to implement antiterrorism/force protection construction standards and develop protective measures for DoD assets in accordance with: DoD Instruction 2000.16, *DoD Combating Terrorism Standards*, AFI 31-101, *The Air Force Installation Security Program*, and AFH 32-1084 *Facility Requirements*.

#### Air Quality

The *Clean Air Act* (CAA) [42 U.S.C. Sec. 7401, *et seq.*, as amended] establishes as federal policy the protection and enhancement of the quality of the Nation's air resources to protect human health and the environment. The CAA sets national primary and secondary ambient air quality standards as a framework for air pollution control.

The *Colorado Air Pollution Prevention and Control Act* [Article 7 of the Title 25, *Colorado Revised Statutes*, 1973, as amended] establishes provisions to achieve and maintain levels of air quality that will protect human health and safety, and to require the use of all available practicable methods to reduce, prevent, and control air pollution for the protection of the health, safety, and general welfare of the people of the State of Colorado.

Air Force Instruction (AFI) 32-7040, *Air Quality Compliance*, instructs the Air Force on compliance with the CAA, and federal, state, and local regulations.

#### Water Quality

The *Clean Water Act* (CWA) [33 U.S.C. Sec. 1251, *et seq.*, as amended]

establishes federal limits, through the National Pollutant Discharge Elimination System (NPDES), on the amounts of specific pollutants that are discharged to surface waters in order to restore and maintain the chemical, physical, and biological integrity of the water. A NPDES permit, or modification to an existing permit, would be required for any change from the present parameters in the quality or quantity of wastewater discharge and/or storm water runoff.

AFI 32-7041, *Water Quality Compliance*, instructs the Air Force on how to assess, attain, and sustain compliance with the CWA and federal, state, and local environmental regulations.

The *Colorado Water Quality Control Act* [Title 25] establishes provisions for the control and prohibition of air and water pollution within the state. In addition, the Colorado Department of Public Health and Environment (CDPHE) is responsible for administering the permitting program created under the act. No stationary installation that is reasonably expected to be a source of water pollution may be operated, maintained, constructed, expanded, or modified without an appropriate permit issued by the department.

EO 11988, *Floodplain Management*, requires federal agencies to evaluate the potential effects of actions on floodplains and to avoid adverse floodplain impacts wherever possible.

### **Wetlands**

EO 11990, *Protection of Wetlands*, requires federal agencies to take action to avoid, to the extent practicable, the destruction, loss, or degradation of

wetlands and to preserve and enhance the natural and beneficial values of wetlands. The intent of EO 11990 is to avoid direct or indirect construction in wetlands if a feasible alternative is available. All federal and federally supported activities and projects must comply with EO 11990.

AFI 32-7064, *Integrated Natural Resource Management*, Section 3, provides the Air Force with guidance for no net loss of wetlands on Air Force installations.

### **Biological Resources**

The *Endangered Species Act* (ESA) [16 U.S.C. Sec. 1531-1543] requires federal agencies that authorize, fund, or carry out actions to avoid jeopardizing the continued existence of threatened or endangered species and to avoid destroying or adversely modifying their critical habitat. Federal agencies must evaluate the effects of their actions on threatened or endangered species of fish, wildlife, and plants, and their critical habitats, and take steps to conserve and protect these species. All potentially adverse impacts to federally threatened and endangered species must be avoided or mitigated.

The *Migratory Bird Treaty Act* [16 U.S.C. Sec. 703-711] imposes substantive obligations on federal agencies to protect migratory birds and their habitats.

AFI 32-7064, *Integrated Natural Resource Management*, provides the Air Force with guidance on compliance with the ESA and federal, state, and local environmental regulations.

AFI 32-1053 *Pest Management*, provides the Air Force with guidance on managing noxious weeds.

## Cultural Resources

The *National Historic Preservation Act* (NHPA) of 1966 [16 U.S.C. Sec. 470, *et seq.*, as amended] requires federal agencies to determine the effect of their actions on cultural resources and take certain steps to ensure these resources are located, identified, evaluated, and preserved.

The *Archaeological Resources Protection Act* (ARPA) [16 U.S.C. Sec. 470a-11, as amended] protects archeological resources on federal lands. If archaeological resources are discovered that may be disturbed during site activities, the Act requires permits for excavating and removing the resource.

AFI 32-7065, *Cultural Resource Management*, provides the Air Force with guidance on compliance with the NHPA, ARPA, and applicable federal, state, and local regulations.

## Solid Waste

AFI 32-7042, *Solid and Hazardous Waste Compliance*, provides guidance to the Air Force on compliance with RCRA and applicable federal, state, and local regulations.

## Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*, directs federal agencies to identify and address any disproportionately high and adverse human or environmental impacts of federal actions on minority or low-income populations.

Environmental Justice also takes into consideration EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, which was

signed by the President on April 21, 1997. This EO requires that each federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on children, who are more at risk because of developing body systems, comparatively higher consumption-to-weight ratios, behaviors that may expose them to more risks and hazards than adults, and less ability than adults to protect themselves from harm.

## 5.2 Permit Requirements

The permit requirements identified for resource categories analyzed as part of this EA are identified below.

### El Paso County Dust Control Permit.

A permit must be obtained from El Paso County prior to the start of construction activities that disturb more than 1 acre and less than 25 acres.

### Colorado Air Pollutant Emissions

**Notice (APEN).** An APEN for particulate matter would not be required for this project since the ground would not be disturbed for more than 6 months and is less than 25 acres in size. APENs would not be required for other criteria pollutants because this project would not add any stationary sources.

### Hazardous Air Pollutant (HAP)

**Permit.** Only negligible amounts of HAPs would be generated and they would be well below the thresholds required for permits. No stationary sources generating HAPs would be added for this project.

### Prevention of Significant

### Deterioration (PSD) Requirements.

Schriever AFB is not subject to Prevention of Significant Deterioration (PSD) review requirements of 40 CFR 52.21 and Code of Colorado

Regulations, Title 5, Chapter 1001, Regulation 3, Part B, Section IV.D.3 because the actual or potential emissions of any criteria pollutant does not exceed 250 tons per year.

**Phase II National Pollutant Discharge Elimination System (NPDES) Permits.**

A permit is required for soil disturbance of one or more acres. This permit generally requires a storm water pollution prevention plan and best management practices specific to the proposed construction activity. A Phase II NPDES permit would be required for construction activities since two acres would be disturbed.

**Floodplain Requirements.** Executive Order 11988, *Floodplain Management*, provides that if an agency of the Federal government proposes to conduct an activity of development in a 100-year floodplain area, it will consider alternatives to the action and modify its actions, to the extent feasible, to avoid adverse effects or potential harm. Alternatives were considered in the EA to minimize impacts to the floodplains. A Finding of No Practicable Alternative (FONPA) has been prepared to describe the action and alternatives. Coordination with the USACE has determined that construction of the fence would not include any discharges of dredged or fill material into waters of the United States. No permits would be required (Humphreys, 2003).

**Stream Bed Permit.** A permit from the USACE is required for any action constituting a fill or dredging of a stream bed which has been defined as waters of the United States. Installing fence posts and chain link fence fabric is not considered fill and a permit would not be required (see Appendix A, Letter #4).

# **CHAPTER 6**

## **AGENCIES AND PERSONS CONTACTED**





## **6. AGENCIES AND PERSONS CONTACTED**

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A scoping letter and copy of the Description of Proposed Action and Alternatives (Chapters 1 and 2 of the EA) were sent to the following agencies on August 8, 2003. Copies of the response letters received from the agencies are provided in Appendix A.

Colorado Historical Society  
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Denver, Colorado 80203-2137

United States Fish and Wildlife Service  
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Colorado Natural Heritage Program  
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#### **U.S. Army Corps of Engineers**

Ms Diana Humphreys, Southern  
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**CHAPTER 7**  
**LIST OF PREPARERS**



## **7. LIST OF PREPARERS AND CONTRIBUTORS**

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This Environmental Assessment has been prepared by the Air Force Center for Environmental Excellence and the 50<sup>th</sup> Civil Engineer Squadron at Schriever AFB with contractual assistance from LABAT-ANDERSON INCORPORATED. The following personnel were involved in the preparation and review of this report:

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# **CHAPTER 8**

## **REFERENCES**





## 8. REFERENCES

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- CAQCC — *see* Colorado Air Quality Control Commission
- CDPHE — *see* Colorado Department of Public Health and Environment
- CNHP— *see* Colorado Natural Heritage Program
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**APPENDIX A**  
**AGENCY CONSULTATION**



## **APPENDIX A — Agency Consultation**

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To assist EA preparers, letters requesting comments on possible issues of concern related to the Alternatives were sent to Federal, state, and local agencies with pertinent resource responsibilities. A description of the Alternatives was attached to the letter. A sample copy of this scoping letter is included in this appendix. The list of agencies that received a scoping letter are included in Chapter 6.

Table A-1 lists the agencies that responded to the scoping letter. The letters are in order according to how they are presented (a number has been assigned to each letter). Following the letters is a copy of the notice of availability that ran in the Colorado Springs Gazette on September 10, 2003.

<b>Table A-1 Agency Letters Received</b>		
<b><i>Number</i></b>	<b><i>Agency</i></b>	<b><i>Date of Response</i></b>
1	Sample Scoping Letter	August 8, 2003
2	Colorado Historical Society	August 12, 2003
3	U.S. Fish and Wildlife Service	August 18, 2003
4	Albuquerque District, Corps of Engineers	August 20, 2003
5	State of Colorado, Division of Wildlife	September 3, 2003
	Notice of Availability	



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**SAMPLE SCOPING LETTER**  
**DEPARTMENT OF THE AIR FORCE**  
50TH SPACE WING (AFSPC)

①

August 8, 2003

Colorado Historical Society  
Ms Georgianna Contiguglia, SHPO  
1300 Broadway  
Denver, Colorado 80203-2137

Dear Ms Contiguglia:

The Air Force is proposing to implement antiterrorism/force protection measures by constructing a six-square mile security fence around the buffer zone at Schriever Air Force Base, CO. The proposed eight-foot chain link fence would replace an existing four-foot barbed wire fence. The existing barbed-wire fence does not meet Air Force requirements for security and is typically used for livestock barriers. There is an existing access path along the fenceline used by security forces to patrol the property boundary. This existing access path would be used by construction crews to access the area. A Description of the Proposed Action and Alternatives describing the project in more detail is attached.

According to the National Environmental Policy Act (NEPA), the Air Force must assess the potential environmental impacts of the proposed and alternative actions. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, the Air Force is requesting input from other Federal, state, and local agencies on the proposal. Please identify any resources within your agency's purview that may be potentially impacted.

Please provide any comments or information by September 2, 2003. Responses should be sent directly to the address listed above or via electronic mail to [melissa.trenchik@schriever.af.mil](mailto:melissa.trenchik@schriever.af.mil).

Your assistance in providing information is greatly appreciated. If you have any questions, please call me at (719) 567-3360.

Sincerely,

Ms Melissa Trenchik  
Environmental Protection Specialist

Attachment: Description of the Proposed Action and Alternatives



COLORADO  
HISTORICAL  
SOCIETY

The Colorado History Museum 1300 Broadway Denver, Colorado 80203-2137

August 12, 2003

Melissa Trenchik  
Environmental Protection Specialist  
50 CES/CEV  
500 Navstar Street, Suite 19  
Schriever AFB, CO 80912-5019

Re: Schriever Air Force Base Security Fence

Dear Ms. Trenchik:

This is to acknowledge receipt of your August 8, 2003 correspondence concerning the project listed above.

A search of our files indicates that the location of this project has been surveyed for cultural resources and that no historic properties are located within the area of potential effect. Therefore, we find that no historic properties will be affected by the project.

If unidentified archaeological resources are discovered in the course of the project, work must be interrupted until the resources have been evaluated in terms of the National Register of Historic Places eligibility criteria (36 CFR 60.4) in consultation with this office.

Thank you for the opportunity to comment. If we may be of further assistance, please contact Jim Green at 866-4674.

Sincerely,

Georgianna Contiguglia  
State Historic Preservation Officer

GC/WJG



# United States Department of the Interior

③

## FISH AND WILDLIFE SERVICE

Ecological Services  
Colorado Field Office  
755 Parfet Street, Suite 361  
Lakewood, Colorado 80215

IN REPLY REFER TO:  
ES/CO: T&E/splst  
Mail Stop 65412

AUG 18 2003

Ms. Melissa Trenchik  
Department of the Air Force  
300 O'Maley Avenue  
Suite 19  
Shriver Air Force Base, Colorado 80912

Dear Ms. Trenchik:

The U.S. Fish and Wildlife Service (Service) received your letter dated August 8, 2003, regarding a proposed fence replacement around Shriver Air Force Base in El Paso County, Colorado. The fence would enclose approximately six-square miles. These comments have been prepared under the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et. seq.).

To assist you in your review, a list of federally listed and proposed species is enclosed. A careful evaluation of all species listed for El Paso county should be made.

Thank you the opportunity to comment on your project. If the Service can be of further assistance, please contact Jeff Peterson at (303) 275-2370.

Sincerely,

Susan C. Linner  
Colorado Field Supervisor

Enclosure: Species List

## COUNTIES

U. S. Fish and Wildlife Service  
Ecological Services  
Colorado Field Office

(Effective July 10, 2003)

## FEDERALLY LISTED AND CANDIDATE SPECIES &amp; THEIR STATUS IN COLORADO

1

	A D A M S	A L A M O S A	A R A P A H O E	A R C H U L E T A	B A C A	B E N T	B O U L D E R	B R O O M F I E L D	C H A F F E	C H E Y E N N E	C L E A R C R E E K	C O N E J O S	C O S T I L L A	C R O W L E Y	C U S T E R	D E L T A	D E N V E R
Bald eagle, <i>Haliaeetus leucocephalus</i> , Listed Threatened	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gunnison sage-grouse, <i>Centrocercus minimus</i> , Candidate for Listing		✓		✓					✓			✓	✓			✓	
Least tern (interior population), <i>Sterna antillarum</i> , Listed Endangered	*		*			✓	*	*			*			✓			*
Lesser prairie chicken, <i>Tympanuchus pallidicinctus</i> , Candidate for Listing					✓	✓				✓				✓			
Mexican spotted owl, <i>Strix occidentalis lucida</i> , Listed Threatened	✓	✓	✓	✓			✓		✓		✓	✓	✓		✓		
Mountain plover, <i>Charadrius montanus</i> , Proposed Threatened	✓	✓	✓		✓	✓	✓	✓		✓		✓	✓	✓			
Piping plover, <i>Charadrius melodus</i> , Listed Threatened					✓	✓											
Southwestern willow flycatcher, <i>Empidonax traillii extimus</i> , Listed Endangered		✓		✓								✓	✓				
Whooping crane, <i>Grus americana</i> , Listed Endangered	*		*				*	*			*						*
Yellow-billed cuckoo, <i>Coccyzus americanus</i> , Candidate for Listing		✓		✓								✓	✓			✓	
Black-footed ferret, <i>Mustela nigripes</i> , Listed Endangered	✓	✓	✓	✓	✓	✓		✓		✓		✓	✓	✓		✓	
Black-tailed prairie dog, <i>Cynomys ludovicianus</i> , Candidate for Listing	✓		✓		✓	✓	✓	✓		✓				✓			✓
Canada lynx, <i>Lynx canadensis</i> , Listed Threatened		✓		✓			✓		✓		✓	✓	✓		✓	✓	
Preble's meadow jumping mouse, <i>Zapus hudsonius preblei</i> , Listed Threatened	✓		✓				✓	✓									✓
Boreal toad, <i>Bufo boreas boreas</i> , Candidate for Listing				✓			✓		✓		✓	✓				✓	

U. S. Fish and Wildlife Service  
Ecological Services  
Colorado Field Office

(Effective July 15, 2002)

## FEDERALLY LISTED AND CANDIDATE SPECIES &amp; THEIR STATUS IN COLORADO

	COUNTIES -	D O L O R E S	D O U G L A S	E A G L E	E L B E R T	E L P A S O	F R E M O N T	G A R F I E L D	G I L P I N	G R A N D	G U N N I S O N	H I N S D A L E	H U E R F A N O	J A C K S O N	J E F F E R S O N	K I O W A	K I T C A R S O N
Bald eagle, <i>Haliaeetus leucocephalus</i> , Listed Threatened		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Gunnison sage-grouse, <i>Centrocercus minimus</i> , Candidate for Listing		✓		✓				✓			✓						
Least tern (interior population), <i>Sterna antillarum</i> , Listed Endangered			*		*	*			*					*	*	✓	
Lesser prairie chicken, <i>Tympanuchus pallidicinctus</i> , Candidate for List																✓	
Mexican spotted owl, <i>Strix occidentalis lucida</i> , Listed Threatened		✓	✓			✓	✓	✓	✓				✓		✓		
Mountain plover, <i>Charadrius montanus</i> , Proposed Threatened			✓		✓	✓	✓						✓	✓		✓	✓
Piping plover, <i>Charadrius melodus</i> , Listed Threatened																✓	✓
Southwestern willow flycatcher, <i>Empidonax traillii eximius</i> , Listed Endangered		✓										✓					
Whooping crane, <i>Grus americana</i> , Listed Endangered			*		*	*			*					*	*		
Yellow-billed cuckoo, <i>Coccyzus americanus</i> , Candidate for Listing		✓		✓				✓		✓	✓	✓					
Black-footed ferret, <i>Mustela nigripes</i> , Listed Endangered		✓	✓	✓	✓	✓	✓									✓	✓
Black-tailed prairie dog, <i>Cynomys ludovicianus</i> , Candidate for Listing		✓	✓		✓	✓	✓						✓		✓	✓	✓
Canada lynx, <i>Lynx canadensis</i> , Threatened		✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓		
Preble's meadow jumping mouse, <i>Zapus hudsonius preblei</i> , Listed Threatened			✓		✓	✓									✓		
Arkansas darter, <i>Etheostoma caeruleum</i> , Candidate for Listing					✓	✓	✓						✓			✓	
Bonytail, <i>Gila elegans</i> , (presumed-historical) Listed Endangered		*		*				✓		*	*	*					
Colorado pikeminnow, <i>Ptychocheilus lucius</i> , Listed Endangered		*		*				✓		*	*	*					
Greenback cutthroat trout, <i>Oncorhynchus clarki stansburyi</i> , Listed Threatened			✓			✓							✓				
Humpback Chub, <i>Gila cypha</i> , Listed Endangered		*		*				✓		*	*	*					

U. S. Fish and Wildlife Service  
Ecological Services  
Colorado Field Office

(Effective July 10, 2003)

## FEDERALLY LISTED AND CANDIDATE SPECIES &amp; THEIR STATUS IN COLORADO

	L A K E	L A P L A T A	L A R I M E R	L A S A N I M A S	L I N C O L N	L O G A N	M E S A	M I N E R A L	M O F F A T	M O N T E Z U M A	M O N T R O S E	M O R G A N	O T E R O	O U R A Y	P A R K	P H I L L I P S
Bald eagle, <i>Haliaeetus leucocephalus</i> , Listed Threatened	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gunnison sage-grouse, <i>Centrocercus minimus</i> , Candidate for Listing		✓					✓			✓	✓			✓		
Least tern (interior population), <i>Sterna antillarum</i> , Listed Endangered			*		*	*						✓	✓		*	
Lesser prairie chicken, <i>Tympanuchus pallidicinctus</i> , Candidate for Listing					✓											
Mexican spotted owl, <i>Strix occidentalis lucida</i> , Listed Threatened		✓	✓	✓					✓	✓	✓				✓	
Mountain plover, <i>Charadrius montanus</i> , Proposed Threatened			✓	✓	✓	✓			✓			✓	✓		✓	
Piping plover, <i>Charadrius melodus</i> , Listed Threatened				✓								✓				
Southwestern willow flycatcher, <i>Empidonax traillii eximius</i> , Listed Endangered		✓						✓		✓						
Yellow-billed cuckoo, <i>Coccyzus americanus</i> , Candidate for Listing		✓					✓	✓	✓	✓	✓			✓		
Whooping crane, <i>Grus americana</i> , Listed Endangered			*		*	*						*			*	
Black-footed ferret, <i>Mustela nigripes</i> , Listed Endangered		✓	✓	✓	✓				✓	✓	✓	✓	✓			
Black-tailed prairie dog, <i>Cynomys ludovicianus</i> , Candidate for Listing			✓	✓	✓	✓						✓	✓			✓
Canada lynx, <i>Lynx canadensis</i> , Listed Threatened	✓	✓	✓	✓			✓	✓	✓	✓	✓			✓	✓	
Preble's meadow jumping mouse, <i>Zapus hudsonius preblei</i> , Listed Threatened			✓									✓				
Arkansas darter, <i>Etheostoma caeruleum</i> , Candidate for Listing				✓	✓								✓			
Bonyta, <i>Gila elegans</i> , (presumed-historical) Listed Endangered							⊙		⊙		*			*		
Colorado pikeminnow, <i>Psychocheilus lucius</i> , Listed Endangered		*					⊙	*	⊙	*	*			*		
Greenback cutthroat trout, <i>Oncorhynchus clarki stewarti</i> , Listed Threatened	✓		✓												✓	
Humpback chub, <i>Gila cypha</i> , Listed Endangered							⊙		⊙		*			*		



U. S. Fish and Wildlife Service  
Ecological Services  
Colorado Field Office

(Effective July 10, 2003)

## FEDERALLY LISTED AND CANDIDATE SPECIES &amp; THEIR STATUS IN COLORADO

	COUNTIES	P I T K I N	P R O W E R S	P U E B L O	R I O B L A N C O	R I O G R A N D E	R O U T	S A G U A C H E	S A N J U A N	S A N M I G U E L	S E D G W I C K	S U M M I T	T E L L E R	W A S H I N G T O N	W E I D	Y U M A
Bald eagle, <i>Haliaeetus leucocephalus</i> , Listed Threatened		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gunnison sage-grouse, <i>Centrocercus minimus</i> , Candidate for Listing		✓				✓		✓		✓						
Least tern (interior population), <i>Sterna antillarum</i> , Listed Endangered			✓								✓		*	✓	✓	
Lesser prairie chicken, <i>Tympanuchus pallidicinctus</i> , Candidate for Listing			✓													
Mexican spotted owl, <i>Strix occidentalis lucida</i> , Listed Threatened		✓		✓		✓		✓		✓		✓	✓		✓	
Mountain plover, <i>Charadrius montanus</i> , Proposed Threatened			✓	✓	✓	✓		✓						✓	✓	✓
Piping plover, <i>Charadrius melodus</i> , Listed Threatened			✓								✓			✓	✓	
Southwestern willow flycatcher, <i>Empidonax traillii eximius</i> , Listed Endangered						✓		✓	✓	✓						
Whooping crane, <i>Grus americana</i> , Listed Endangered											*		*	*	*	
Yellow-billed cuckoo, <i>Coccyzus americanus</i> , Candidate for Listing		✓			✓	✓	✓	✓	✓	✓		✓				
Black-footed ferret, <i>Mustela nigripes</i> , Listed Endangered			✓	✓	✓			✓		✓				✓	✓	
Black-tailed prairie dog, <i>Cynomys ludovicianus</i> , Candidate for Listing			✓	✓							✓		✓	✓	✓	✓
Canada lynx, <i>Lynx canadensis</i> , Listed Threatened		✓		✓	✓	✓	✓	✓	✓	✓		✓				
Preble's meadow jumping mouse, <i>Zapus hudsonius preblei</i> , Listed Threatened															✓	
Pawnee montane skipper, <i>Hesperia leonardus montana</i> , Listed Threatened													✓			
Uncompahgre fritillary butterfly, <i>Boloria acrocnema</i> , Listed Endangered		✓				✓		✓	✓	✓		✓				
Arkansas darter, <i>Etheostoma caeruleum</i> , Candidate for Listing			✓	✓												
Bonytail, <i>Gila elegans</i> , (presumed-historical) Listed Endangered		*			*		*	*		*		*				
Colorado pikeminnow, <i>Ptychocheilus lucius</i> , Listed Endangered		*			*	*	*	*	*	*		*				



### TABLE TERMINOLOGY

✓	The check mark indicates that the species is present in that county or that the county is within the historical range of the species
*	Water depletions in these counties may affect these species
⊗	This sign means that the species is present in the county and there is designated critical habitat for the species within the county
Candidate	Means there is sufficient information indicating that formal listing under the ESA may be appropriate
Proposed	Means the species is proposed for possible addition to the Lists of Endangered and Threatened Wildlife and Plants under the ESA
Endangered	Means the species could become extinct
Threatened	Means the species could become endangered



DEPARTMENT OF THE ARMY  
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS  
SOUTHERN COLORADO REGULATORY OFFICE  
720 NORTH MAIN STREET SUITE 300  
PUEBLO CO 81003-3047

4

August 20, 2003

Operations Division  
Regulatory Branch

Ms. Melissa Trenchik  
Schriever Air Force Base  
300 O'Malley Avenue, Suite 19  
Schriever AFB, CO 80912-5019

Dear Ms. Trenchik:

This replies to your August 8, 2003, letter regarding the proposed security fence in a tributary of Black Squirrel Creek near Falcon, El Paso County, Colorado. We have assigned Action No. 2003 00494 to this activity.

We have evaluated the information you provided and studied the project description, other records, and documents available to us. Diana L. Humphreys visited the site on 4 August 2003. Waters of the United States are located within the project site. An unnamed tributary of Black Squirrel Creek is regulated under provisions of Section 404 of the Clean Water Act. The proposed security fence does not include any discharges of dredged or fill material into waters of the United States. Therefore, the proposed project is not regulated under the provisions of Section 404 of the Clean Water Act and a Department of the Army permit will not be required.

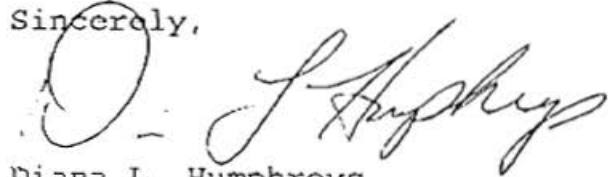
Our disclaimer of jurisdiction is only for Section 404 of the Federal Clean Water Act. Other Federal, state and local laws may apply to the activities. Therefore, you should also contact other Federal, state and local regulatory authorities to determine whether the activities may require other authorizations or permits.

This jurisdictional determination will be valid for 5 years from the date of this letter unless new information warrants revision of the determination within that time.

If you have any questions, please feel free to contact me at (719) 543-8102 or e-mail me at [diana.l.humphreys@usacc.army.mil](mailto:diana.l.humphreys@usacc.army.mil).

For more information about the regulatory program, please see our web site at [www.spa.usace.army.mil/reg](http://www.spa.usace.army.mil/reg).

Sincerely,

A handwritten signature in cursive script, appearing to read "D. L. Humphreys". The signature is written in dark ink and is positioned to the right of the word "Sincerely,".

Diana L. Humphreys  
Project Manager

STATE OF COLORADO  
 Bill Owens, Governor  
 DEPARTMENT OF NATURAL RESOURCES  
**DIVISION OF WILDLIFE**  
 AN EQUAL OPPORTUNITY EMPLOYER

Russell George, Director  
 6060 Broadway  
 Denver, Colorado 80216  
 Telephone: (303) 297-1192



*For Wildlife-  
 For People*

September 3, 2003

Ms. Melissa Trenchik  
 Environmental Protection Specialist  
 300 O'Malley Ave, Suite 19  
 Schriever AFB, CO 80912-5019  
[Melissa.trenchik@schriever.af.mil](mailto:Melissa.trenchik@schriever.af.mil)

Dear Ms. Trenchik:

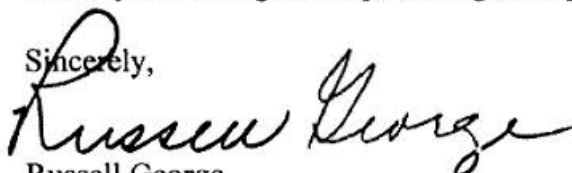
Thank you for providing the Division of Wildlife the opportunity to comment on the proposed security fence at Schriever Air Force Base. We have reviewed the proposal and do not foresee any major impacts to wildlife within the proposed fenced area. We also do not anticipate impacts to any state or federally threatened or endangered species due to the construction of the fence.

Pronghorn and deer do frequent the area, and there may be some animals remaining inside the perimeter during construction of the fence. A thorough sweep inside the fence should be made prior to the final sections of fence being installed to ensure no large mammals remain within the fenced area. I would offer the assistance of our local personnel, if necessary, to push any remaining large mammals out of the fenced portion, prior to completion. In the long term, it will be difficult to remove large animals from inside the fence once it has been installed unless contingencies (i.e. locked gates, removable panels) to address those needs are accounted for in the design.

Smaller mammals such as coyote, fox, and badger may pass under or through the fence after it's completion, as this is our experience around airports and other fenced properties. This, however, is not a concern for these species.

Black-tailed prairie dogs may show a population increase, due to the lack of ground predators. The fence should not pose an impact to hawks or owls using the prairie dog town.

Thank you once again for providing this opportunity for input.

Sincerely,  
  
 Russell George  
 Director

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## AFFIDAVIT OF PUBLICATION

STATE OF COLORADO  
COUNTY OF EL PASO

ss.

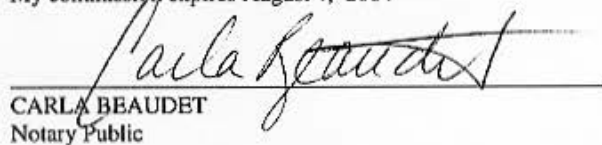
Robyn M. David, being first duly sworn, deposes and says that she is the Legal Sales Representative of FREEDOM NEWSPAPERS, INC., a corporation, the publishers of a daily public newspaper, which is printed and published daily in whole at the city of Colorado Springs in the County of El Paso, and the State of Colorado, and which is called The Gazette; that a notice of which the annexed is an exact copy, cut from said newspaper, was published in the regular and entire editions of said newspaper 1 times, to-wit, on September 10, 2003.

That said newspaper has been published continuously and uninterruptedly in said County of El Paso for a period of at least six consecutive months next prior to the first issue thereof containing this notice; that said newspaper has a general circulation and that it has been admitted to the United States mails as second-class matter under the provisions of the Act of March 3, 1879 and any amendment thereof, and is a newspaper duly qualified for the printing of legal notices and advertisement within the meaning of the laws of the State of Colorado.



ROBYN M. DAVID  
Legal Sales Representative

Subscribed and sworn to me this 17 day of September 2003,  
at said City of Colorado Springs.  
My commission expires August 4, 2004



CARLA BEAUDET  
Notary Public

The Gazette



### NOTICE OF AVAILABILITY DRAFT ENVIRONMENTAL ASSESSMENT (EA) AND DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI) AND FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA) FOR CONSTRUCTION OF A SECURITY FENCE AROUND THE BUFFER ZONE AT SCHRIEVER AIR FORCE BASE, COLORADO

The 50<sup>th</sup> Space Wing, Schriever Air Force Base, Colo. has prepared an Environmental Assessment (EA), draft FONSI/FONPA, to analyze potential impacts from constructing a security fence around the buffer zone at Schriever Air Force Base. The EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, and the Council on Environmental Quality implementing NEPA to analyze the potential environmental consequences of the Proposed Action. No major impacts were identified in the analysis.

The 50<sup>th</sup> SW invites public comments on the EA, which will be available September 10, 2003 to October 9, 2003. The EA will be available at the below listed libraries or by calling 2<sup>nd</sup> Lt. Michaela Herring, 50<sup>th</sup> Space Wing Public Affairs Office, at 567-2145.

Reference Desk: East Library, 5550 N. Union Blvd

Local History Desk: Penrose Library, 20 N. Cascade

Published in The Gazette: September 10, 2003

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# **APPENDIX B**

## **AIR CALCULATIONS**





**APPENDIX B —  
Air Emission Calculations**

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This section includes the calculations performed for estimating air emissions generated from activities related to the Proposed Action. Emissions were estimated using emission factors from AP-42 (USEPA 1985; USEPA, 2000; USEPA, 2001; USEPA, 2003b) and the Nonroad Engine and Vehicle Emission Study (USEPA, 2002).

**Table of Contents**

Table B-1   Estimated Air Emissions from Construction of the Fence .....B-3

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Table B-1 Estimated Air Emissions from Installation of the Security Fence at Schriever AFB								
Emissions Years - FY04								
10 months to construct (200 work days)								
This table includes calculations performed for estimating air emissions generated from activities related to the installation of a security fence around the buffer zone at Schriever AFB.								
Emissions were estimated using emission factors from AP-42 (USEPA, 1995-2003) and Exhaust and Crankcase Emission Factors for Non Road Engine Modeling (USEPA, 2002)								
Summary (emissions in tons per year)								
CO	VOC	NOx	SOx	PM-10				
4.09	0.39	3.42	0.22	5.97				
Summary (emissions in tons per day)								
CO	VOC	NOx	SOx	PM-10				
0.02	0.00	0.02	0.00	0.03				
PM <sub>10</sub> emissions from grading (fugitive dust)								
PM = $\frac{1.0 \cdot s^{1.5}}{M^{1.4}}$		13.133	lb/hr PM	360	hours			
		9.85	lbs/hr PM <sub>10</sub>	3545.8	lbs PM <sub>10</sub>			
				1.77	tons PM <sub>10</sub>			
where s = silt (%), M = moisture (%)								
PM <sub>10</sub> = PM * 0.75								
Sandy loam, silt loam and loamy sand are typically 20-40 percent silt, an average of 25 percent was used.								
5 percent soil moisture was assumed.								
Sources: AP-42 Vol I, Chapter 13.2.3 Heavy Construction Operations, January 1995								
AP-42 Vol I, Chapter 11.9 Western Surface Coal Mining, October 1998								
Construction Equipment Emissions								
Equipment	Days	Hours/day	Pieces	CO	VOC	NOx	SOx	PM-10
Bore/Drill Rig	60	8	2	129.76	16.97	306.60	21.90	25.73
Emissions (grams)				124567.20	16293.60	294336.00	21024.00	24703.20
Emissions (lbs)				274.38	35.89	648.32	46.31	54.41
Tractor/Backhoe	90	8	3	277.55	54.78	282.12	18.26	42.45
Emissions (grams)				599512.32	118324.80	609372.72	39441.60	91701.72
Emissions (lbs)				1320.51	260.63	1342.23	86.88	201.99
Off-highway Truck	120	4	3	491.34	51.59	1400.32	98.27	61.42
Emissions (grams)				707529.60	74290.61	2016459.36	141505.92	88441.20
Emissions (lbs)				1558.44	163.64	4441.54	311.69	194.80
Cement mixer	60	8	2	18.41	1.97	23.43	1.79	2.02
Emissions (grams)				17676.29	1892.35	22493.18	1720.32	1935.36
Emissions (lbs)				38.93	4.17	49.54	3.79	4.26
Total Emissions	lbs			3192.26	464.32	6481.63	448.66	455.47
	tons			1.60	0.23	3.24	0.22	0.23
Emission factors from USEPA, 2002 Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling								
Assumes Tier 1 equipment (model years between 1996 and 2000)								
Emission factors (EF) (in italics) are calculated with the following formula: EF in grams/horsepower-hour multiplied by horsepower,								

multiplied times the typical load factor for each type of equipment.							
EFs and horsepower are derived from USEPA, 2002, using the steady state EF multiplied by the transient adjustment factor.							
Typical load factor from AFIERA, USAF, 2002d Air Emissions Inventory Guidance for Mobile Sources							
<b>Estimated Emissions from Highway Trucks</b>							
<b>Water truck</b>							
<b>Exhaust emissions</b>			<b>CO</b>	<b>HC</b>	<b>NOx</b>	<b>SOx</b>	<b>PM-10</b>
Number of trucks	1	EF (g/mi)	17.07	4.82	6.49	0	0
Distance (miles)	10	lbs/mi	0.03759912	0.01061674	0.014295154	0	0
Days	90	Amt (lbs)	33.84	9.56	12.87	0.00	0.000
Total Miles	900	<b>Amt (tons)</b>	<b>0.02</b>	<b>0.00</b>	<b>0.01</b>	<b>0.00</b>	<b>0.000</b>
EF = Emission Factor for model years 1998 - 2000 in grams per mile, for high altitude vehicles							
Emission factors from AP-42 Compilation of Emission Factors for Mobile Sources Appendix H, Table 7.1.2							
Assumes average vehicle model year of 1998 for high altitude heavy duty diesel powered trucks with 50,000 miles							
<b>Worker Vehicle Trips Emissions</b>							
<b>Exhaust</b>			<b>CO</b>	<b>VOC</b>	<b>NOx</b>	<b>SOx</b>	<b>PM-10</b>
Number of workers	40	EF (g/mi)	9.387	0.598	0.655	0	0
Commute (miles)	30	lbs/mi	0.02067621	0.00131718	0.001442731	0	0
Days	200	Amt (lbs)	4962.29	316.12	346.26	0.00	0.000
Total Miles	240,000	<b>Amt (tons)</b>	<b>2.48</b>	<b>0.16</b>	<b>0.17</b>	<b>0.00</b>	<b>0.000</b>
EF = Emission Factor for calendar year 2000 in grams per mile							
Emission factor from AP-42 Vol II Appendix H Highway Mobile Source Emission Factor Tables							
Assumes average vehicle model year of 1995 for high altitude light duty gas powered vehicles with 50,000 miles							
<b>PM-10 from Trucks Driving on Paved Roads</b>							
		$EF = k(sL/2)^{0.65} (W/3)^{1.5}$			<b>0.012</b>	EF	
Miles/round trip	30						
Trucks/hour	3	where k= particle size multiplier for PM <sub>10</sub> (0.016)					
Hours of activity	2	where sL = silt loading (g/m <sup>2</sup> ), W = mean vehicle weight (tons)					
Days	31						
VMT	5580	EF = emission factor for normal conditions on low traffic roads					
EF (lbs/mile)	0.012						
TOTAL (lbs)	67.483						
<b>Total (tons)</b>	<b>0.03</b>						
Emission factor formula from AP-42 Chapter 13.2.1 Paved Roads (August 2003)							
<b>PM-10 from Trucks Driving on Unpaved Roads</b>							
Miles/round trip	2	$EF = k(s/12)^a (S/30)^d$			2.598		
Trucks/hour	3	$(M/0.5)^c$			1.585		
Hours of activity	8				<b>1.639</b>	EF	
Days	100	where s = silt (%), M = moisture (%), S = mean vehicle speed (mph)					
VMT	4800	k = particle size multiplier (1.8 for PM <sub>10</sub> )					
EF (lbs/mile)	1.639	EF = emission factor for PM10 on unpaved roads (uncontrolled)					
TOTAL (lbs)	7868.5	Sandy loam and loamy sand are typically 10-20 percent silt,					
<b>Total (tons)</b>	<b>3.93</b>	an average of 15 percent was used.					
		5 percent surface moisture was assumed for unpaved roads.					
		Mean vehicle speed assumed is 40 mph					
Emission factor formula from AP-42 Chapter 13.2.2 Unpaved Roads (October 2001)							

<b>SUMMARY</b>	Amounts in tons							
	<b>CO</b>	<b>VOC</b>	<b>NOx</b>	<b>SOx</b>	<b>PM-10</b>			
Grading (fugitive dust)					1.77			
Trucks - paved roads					0.03			
Trucks - unpaved roads					3.93			
Construction Equipment	1.60	0.23	3.24	0.22	0.23			
Highway vehicles	0.02	0.00	0.01	0.00	0.00			
Worker Vehicles	2.48	0.16	0.17	0.00	0.000			
<b>TOTAL Construction</b>	<b>4.09</b>	<b>0.39</b>	<b>3.42</b>	<b>0.22</b>	<b>5.97</b>			
<b>TONS PER YEAR</b>	<b>4.09</b>	<b>0.39</b>	<b>3.42</b>	<b>0.22</b>	<b>5.97</b>			
<b>Pounds</b>	8188	790	6841	449	11937			
<b>Pounds / day avg</b>	<b>41</b>	<b>4</b>	<b>34</b>	<b>2</b>	<b>60</b>			
<b>Tons/day avg</b>	<b>0.02</b>	<b>0.00</b>	<b>0.02</b>	<b>0.00</b>	<b>0.03</b>			
Sources:								
USEPA, 2003b AP-42 Vol I Chapter 13.2.1 Unpaved Roads								
USEPA, 2002 Exhaust and Crankcase Emission Factors for Non Road Engine Modeling								
USEPA, 2001a AP-42 Vol I Chapter 13.2.2 Unpaved Roads								
USEPA, 2000a AP-42 Vol II Appendix H Highway Mobile Source Emission Factor Tables								
See Chapter 8 (References) of the EA for complete reference information								
<b>Assumptions</b>								
<b>Construct Fence</b> 200 days								
<b>Bore/Drill Rig (2)</b> 60 days								
<b>Water Truck</b> 90 days (1 hour per day)								
<b>Cement mixer (2)</b> 60 days								
<b>Off highway truck (3)</b> 120 days								
<b>Tractor/Backhoe (3)</b> 90 days								

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